Order No: MAC011105AC3

Room Air Conditioner

CS-A281KR.CU-A281KR

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Panasonic

1. Features

- High Efficiency
- High Efficiency Airflow Circuit
- Compact Design
- Soft Starter Current
- Auto Restart after Power Failure
- Long Piping up to 30m
- Catechin Deodorizing Air Filter
- Deodorizing Control during operation
- Cold draught Control

2. Functions

3. Product Specifications

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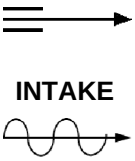
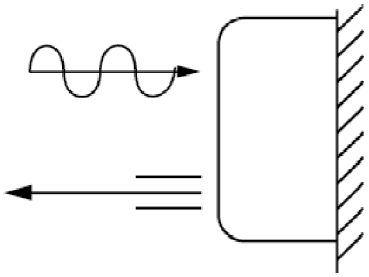
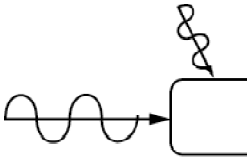
		Unit	CS-A281KR	CU-A281KI
Cooling Capacity		kW Btu/h	8.00 - 7.92 27,300 - 27,000	
Heating Capacity		kW Btu/h	8.40 - 8.35 28,700 - 28,500	
Moisture Removal		l/h Pint/h	3.7 7.8	
Power Source		Phase V Cycle	Single 240 - 230 50	
Airflow Method		OUTLET  INTAKE	SIDE VIEW 	TOP VIEW 
Air Volume	Indoor Air (Lo)	m3/min (cfm)	Cooling; 14.2 (501) Heating; 15.6 (551)	—
	Indoor Air (Me)	m3/min (cfm)	Cooling; 15.0 (530) Heating; 16.4 (579)	—
	Indoor Air (Hi)	m3/min (cfm)	Cooling; 16.3 (575) Heating; 17.7 (625)	—
	Outdoor Air	m3/min (cfm)	—	Cooling; 59.0 (2 Heating; 59.2 (2

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Noise Level			dB (A)	Cooling; 48/46/44 Heating; 48/44	Cooling; 63/ Heating; 63/
Electrical Data	Input		kW	Cooling; 2.65 -2.62 Heating; 2.90 - 2.88	
	Running Current		A	Cooling; 12.0 - 12.2 Heating; 13.2 - 13.2	
	COP		W/W	Cooling; 3.02 - 3.02 Heating; 2.90 - 2.90	
	Starting Current		A	43	
Piping Connection Port (Flare piping)			inch inch	G ; Half Union 5/8” L ; Half Union 1/4”	G ; 3-way valve L ; 3-way valve
Pipe Size (Flare piping)			inch inch	G (gas side); 5/8” L (liquid side); 1/4”	G (gas side); L (liquid side);
Drain Hose	Inner diameter		mm	14	—
	Length		m	0.73	—
Power Cord Length Number of core-wire			m	2.1 3 (2.5 mm2)	— —
Dimensions	Height		inch (mm)	14 - 9/16 (370)	26 - 31/32 (6
	Width		inch (mm)	48 - 1/32 (1,220)	34 - 21/32 (8
	Depth		inch (mm)	8 - 21/32 (220)	13 - 19/32 (3
Net Weight			lb (kg)	40 (18)	154 (70)
Compressor		Type		—	Scroll type
	Motor	Type		—	Induction (2-p
	Rated	Output	kW	—	—
Air Circulation		Type		Cross-flow Fan	Propeller Fa
		Material		AS + Glass Fiber 30%	AS + Glass Fibe
	Motor	Type		Induction (4-poles)	Induction (4-p
		Input	W	—	—
	Rated	Output	W	40	100
	Fan Speed	Low	rpm	Cooling; 1,262 Heating; 1,250	920 - 880
		Medium	rpm	Cooling; 1,322 Heating; 1,328	—
		High	rpm	Cooling; 1,418 Heating; 1,420	1,200 - 1,17
Heat Exchanger	Description			Evaporator	Condense
	Tube material			Copper	Copper
	Fin material			Aluminium	Aluminium
	Fin Type			Louver	Louver
	Row / Stage			(Plate fin configuration, forced draft) 2 × 10	2 × 26
	FPI			18	18
	Size (W × H × L)		mm	966.5 × 254 × 44	826 × 663.9 ×

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Refrigerant Control Device			—	Capillary Tu
Refrigeration Oil		(cm3)	—	SONTEX 200 LT (1,24
Refrigerant (R-22)		g (oz)	—	1,800 (63.5
Thermostat			Electronic Control	Electronic Co
Protection Device			Inner Protector	Inner Protec
Capillary Tube	Length	mm	—	Cooling; 850, Heati
	Flow Rate	l/min	—	Cooling; 21.8, Heati 2 ATM)
	Inner Diameter	mm	—	Cooling; 2.0, Heat
Air Filter	Material		A.B.S	—
	Style		Honeycomb	
Compressor Capacitor		μF, VAC	—	50 μF, 370V
Fan Motor Capacitor		μF, VAC	2.0 μF, 450VAC	3.0 μF, 450V

- Specifications are subject to change without notice for further improvement.

4. Dimensions

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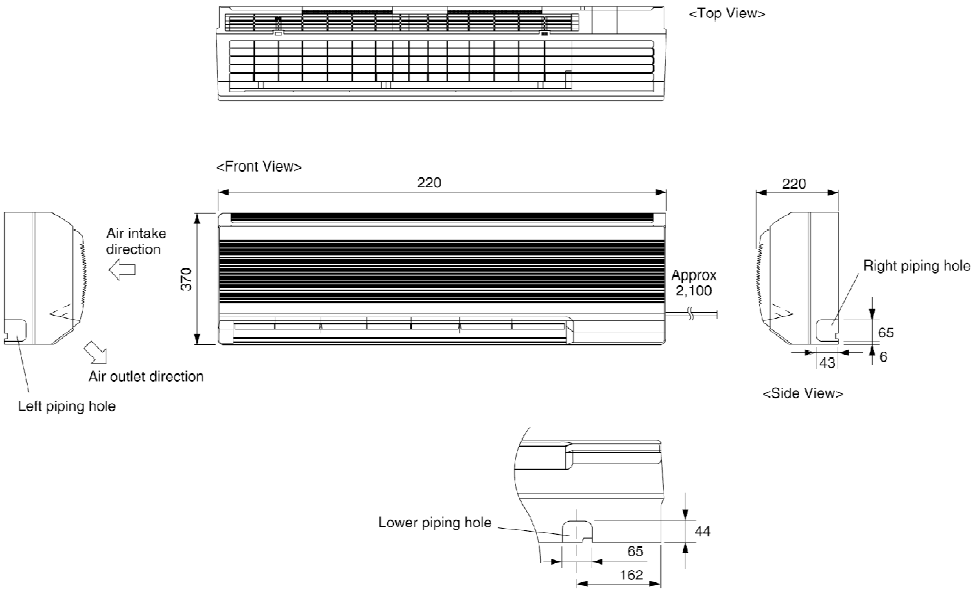
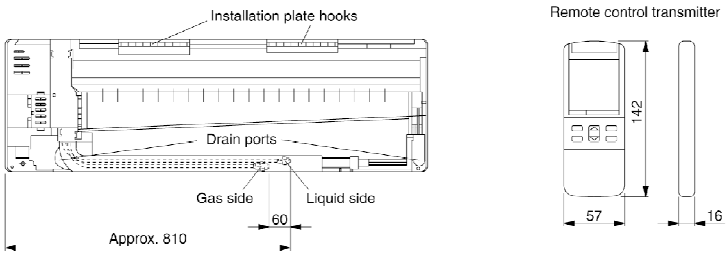
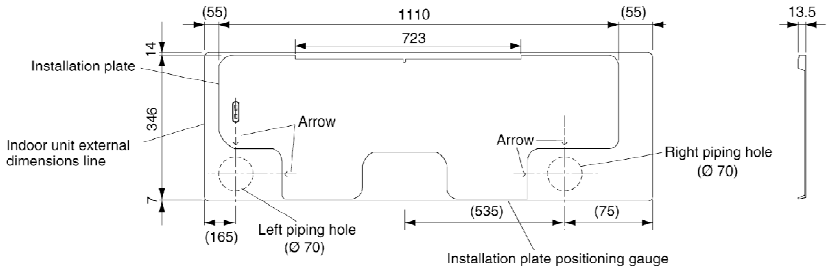




Relative position between the indoor unit and the installation plate <Front View>



Unit : mm

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Dimensions

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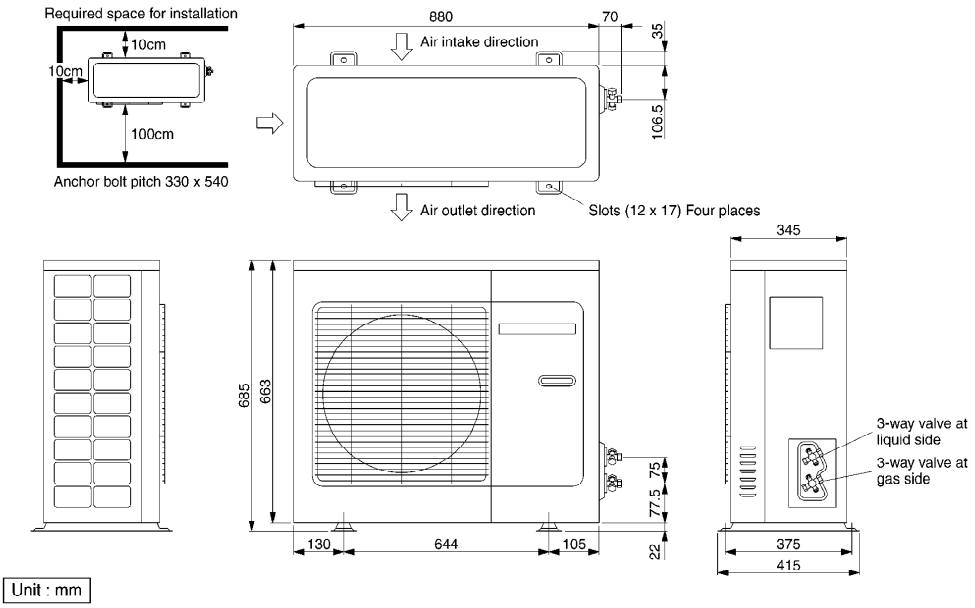

Unit : mm

5. Refrigeration Cycle Diagram

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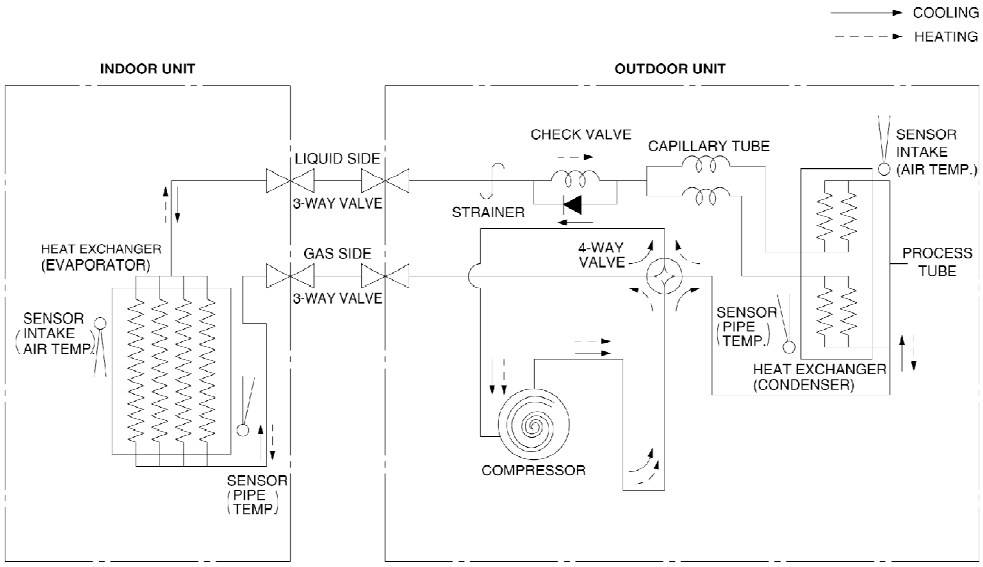

6. Block Diagram

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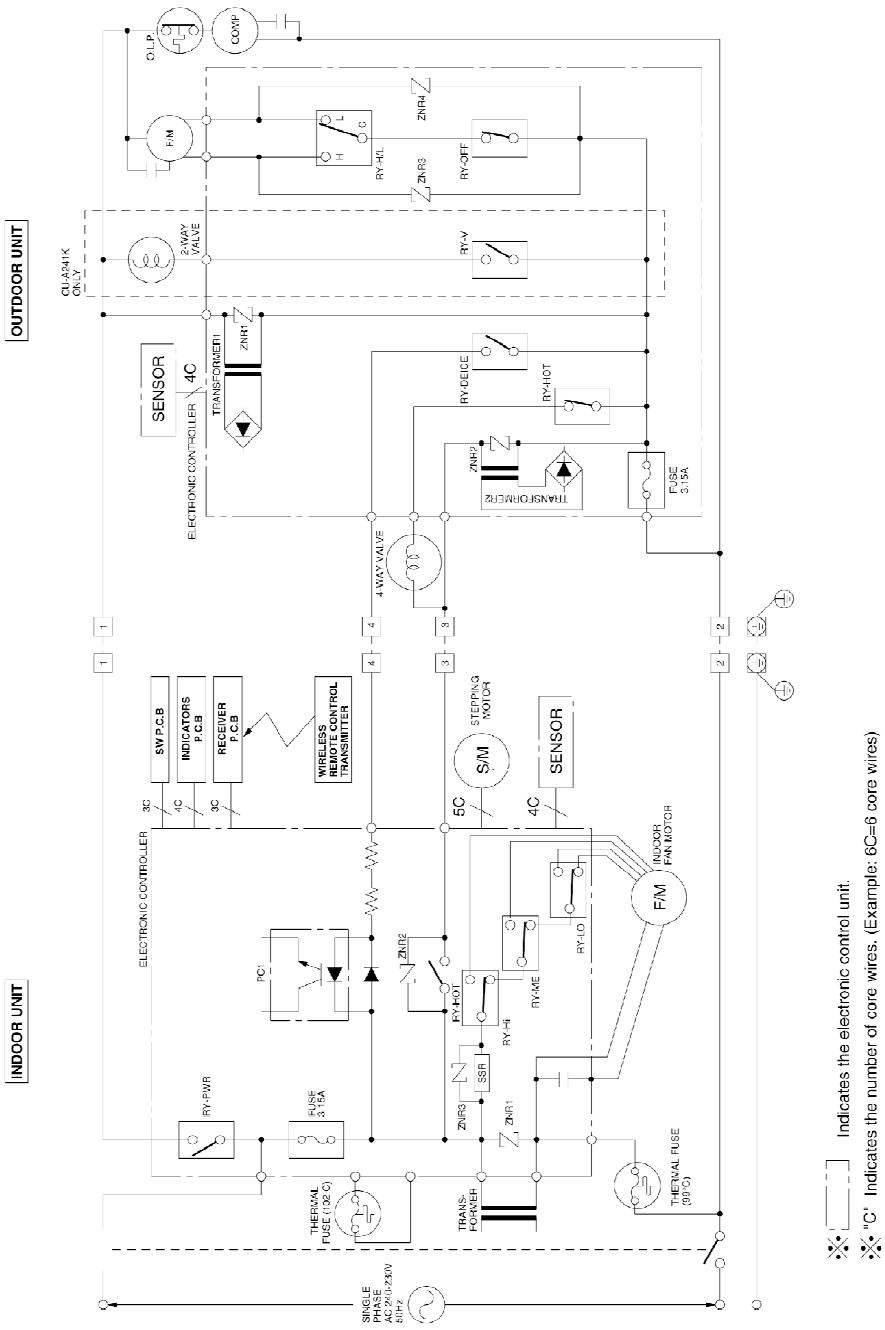

7. Wiring Diagram

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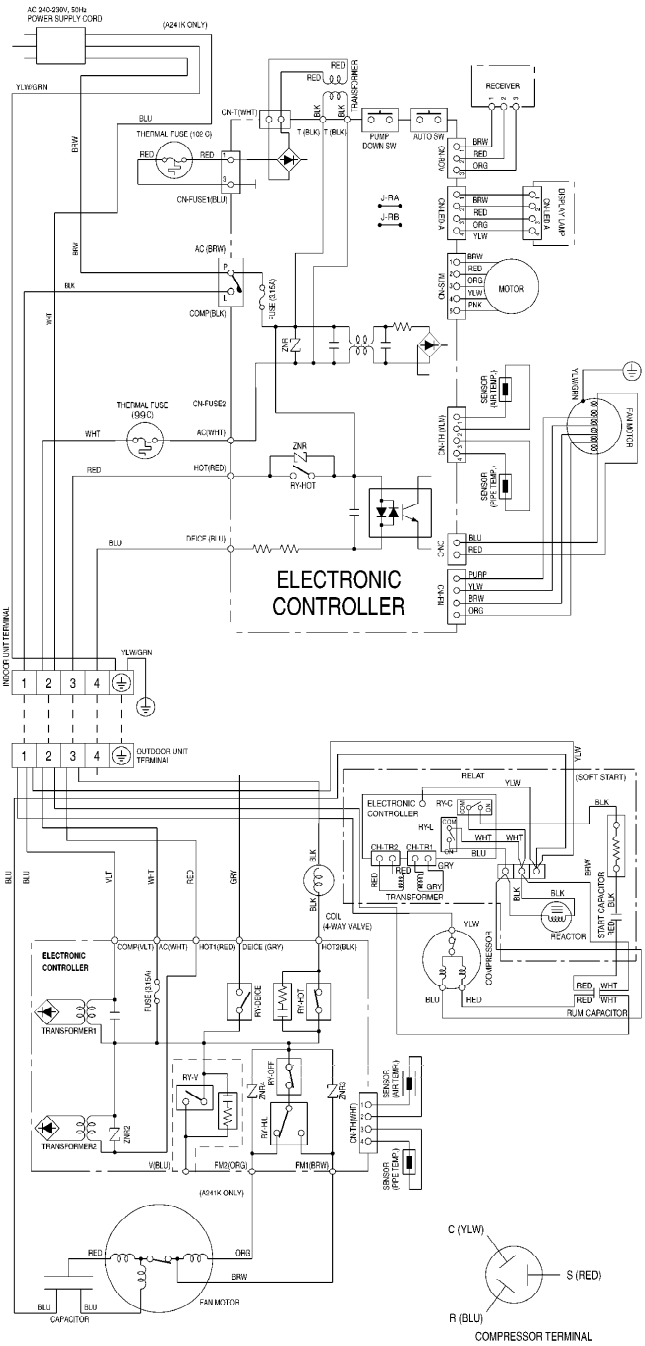

Remarks:

BLU	: BLUE
BRW	: BROWN
BLK	: BLACK
WHT	: WHITE
RED	: RED
ORG	: ORANGE
PNK	: PINK
YLW	: YELLOW
GRN	: GREEN
GRY	: GRAY
VLT	: VIOLET
PURP	: PURPLE

Resistance of Indoor Fan Motor Windings

CONNECTION	CWA4301370
BLUE - PURP	126.2
PURP - YLW	104.5
YLW - BRW	48.1
BRW - ORG	48.5
RED - PURP	131.0

Resistance of Outdoor Fan Motor Windings

CONNECTION	CWA4301380
BLUE - BROWN	50.81
BROWN - ORANGE	34.3
RED - BROWN	92.4

Resistance of Compressor Windings

CONNECTION	ZR34K3PFJ512
C - R	0.937 Ω
C - S	2.07 Ω

8. Operation Details

8.1. Cooling Mode Operation

Cooling in operation according to Remote Control setting.

Time Delay Safety Control (3 minutes)

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- When the compressor is stopped by Power Switch, Remote Control or there is a power failure, it restarts after 3 minutes when the Power Switch, Remote Control is turned ON or the power supply is resumed.
- When the setting temperature is reached during cooling operation, the compressor stops and it will not start for 3 minutes.

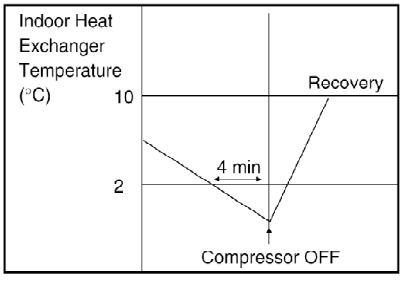
7 minutes Time Saved Control

- The compressor will start automatically if it has stopped for 7 minutes even if the room temperature is below the compressor ON temperature.

Anti-Freezing Control

- If the temperature of the indoor heat exchanger falls continuously below 2°C for 4 minutes, the compressor turns off to protect the indoor heat exchanger from freezing. The fan speed setting remains the same. /
- Compressor recommences when the indoor heat exchanger temperature rises to 10°C (Recovery).

3 minutes waiting of Time Delay Safety Control is valid for Cooling Operation.



Automatic Fan Speed Mode

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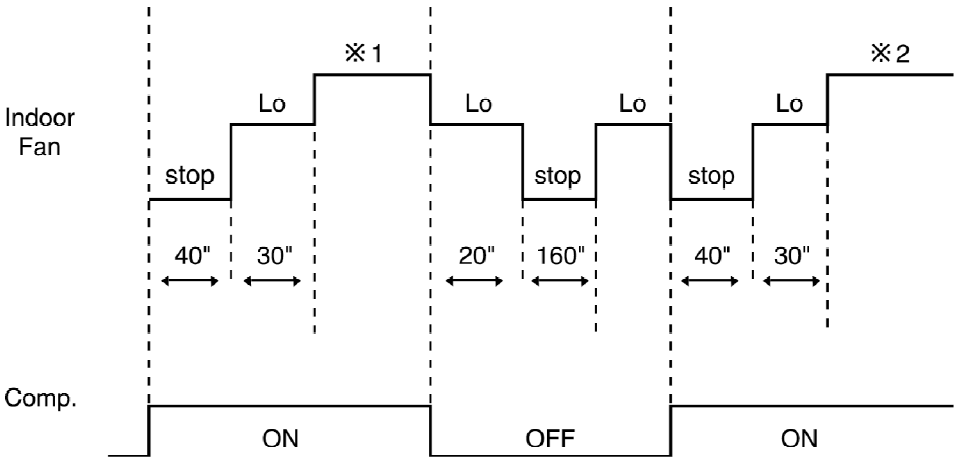
When Automatic Fan Speed is selected at Remote Control during cooling operation.

- Fan speed rotates in the range of Hi to Me.
- Deodorizing Control.



※ 1 Fan Speed is Hi until the compressor stops (when the room temperature reaches setting temperature).

※ 2 Fan Speed is Me after the compressor restarts.

Cooling Operation Time Diagram

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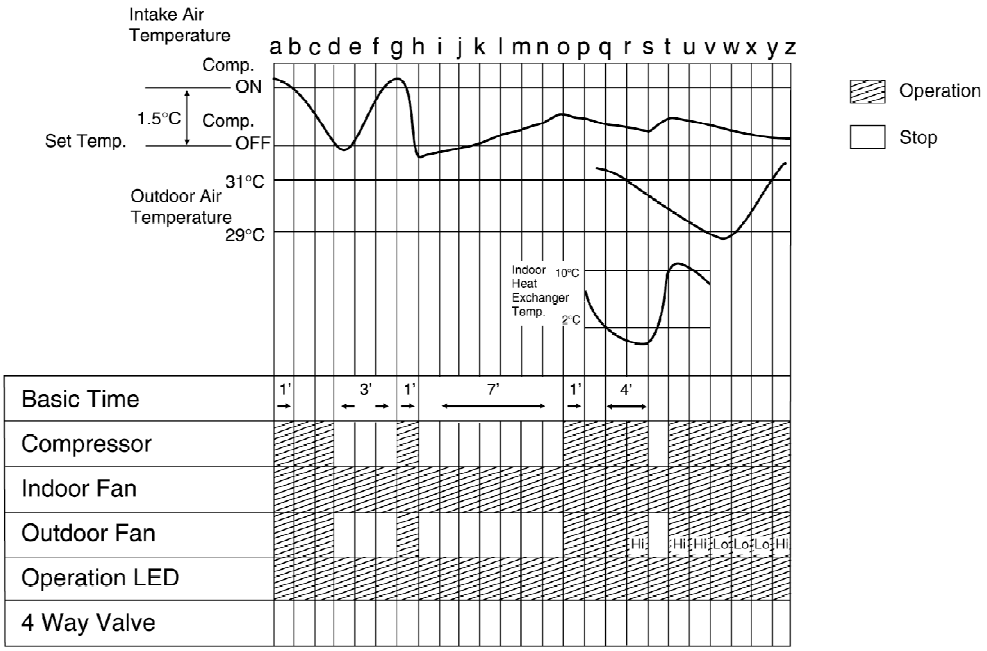

<Description of operation>

d - g : Time Delay Safety Control (waiting for 3 minutes)
g - h : 60 sec. Forced Operation
h - o : 7 min. Time Saved Control
q - t : Anti Freezing Control
v -y : Outdoor Fan Control

8.2. Soft Dry Mode Operation

- The unit starts cooling operation until the room temperature reaches the setting temperature set on the Remote Control, and then Soft Dry operation will start.

- During Soft Dry operation, the Indoor Fan operates with Lo speed.

- Once room temperature reaches below Soft Dry OFF temperature, Indoor Fan, Compressor and Outdoor Fan Stop for 6 minutes.

Time Delay Safety Control

- Once the compressor stops, it will not start for 3 minutes during Cooling operation.

Anti-Freezing Control

- Same as Anti-Freezing Control for Cooling Mode operation. (For

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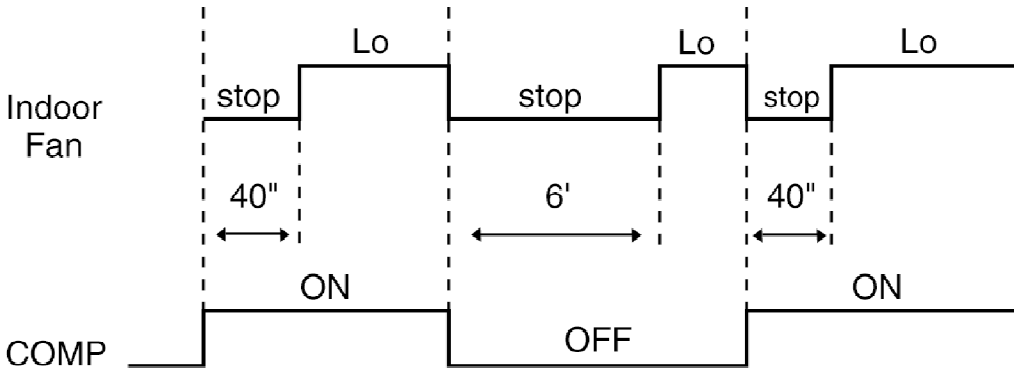
Soft Dry region, 6 minutes waiting is valid during compressor stops.)

Automatic Fan Speed Mode

When Automatic Fan Speed is selected at Remote Control during Soft Dry operation.

- Fan speed rotates at Lo speed.

- Deodorizing Control.



Soft Dry Operation Time Diagram

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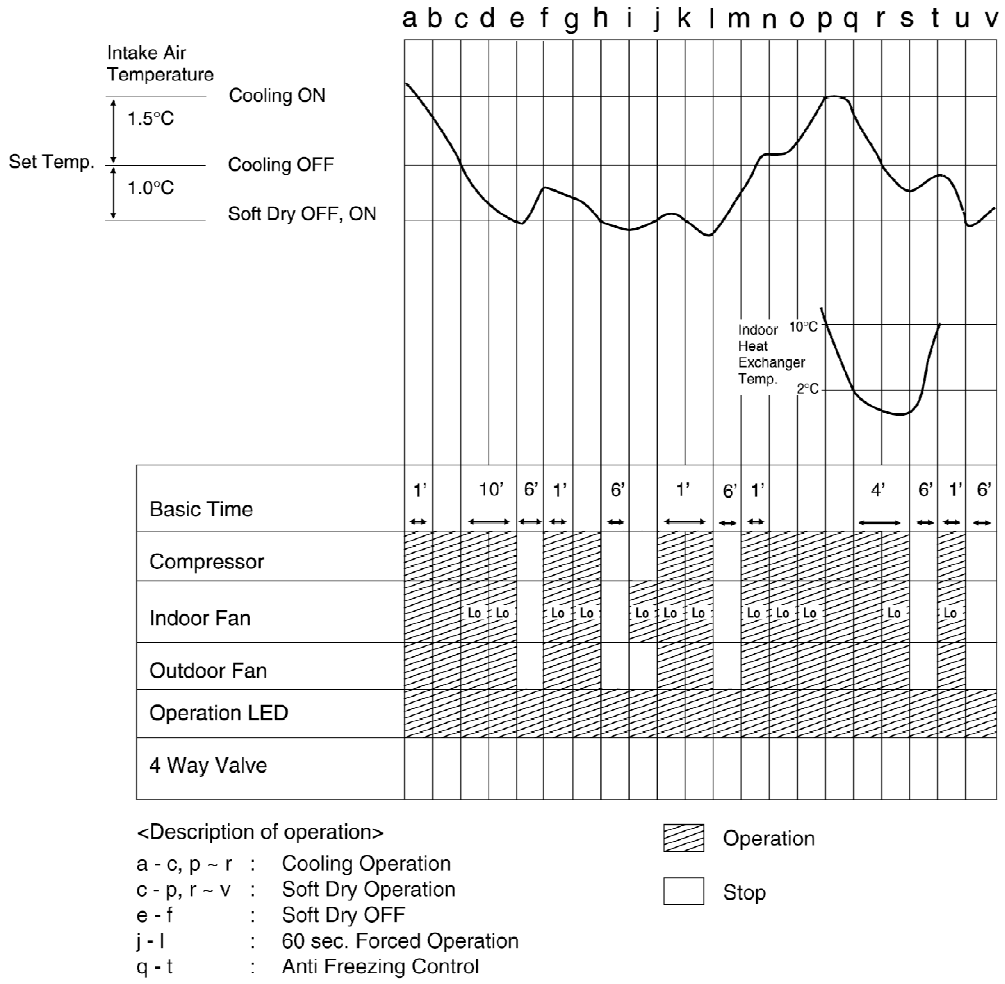
a b c d e f g h i j k l m n o p q r s t u v
Intake Air Temperature
Cooling ON
1.5°C
Set Temp.
Cooling OFF
1.0°C
Soft Dry OFF, ON
Indoor Heat Exchanger Temp.
10°C
2°C
Basic Time
1' 10' 6' 1' 6' 1' 6' 1' 4' 6' 1' 6'
Compressor
Indoor Fan
Lo
Outdoor Fan
Operation LED
4 Way Valve
<Description of operation>
a - c, p ~ r : Cooling Operation
c - p, r ~ v : Soft Dry Operation
e - f : Soft Dry OFF
j - l : 60 sec. Forced Operation
q - t : Anti Freezing Control
Operation
Stop

8.3. Heating Mode Operation

- Heating in operation according to Remote Control setting.

Time Delay Safety Control

- When the compressor is stopped by Power Switch, Remote Control or there is a power failure, it restarts after 3 minutes when the Power Switch, Remote Control is turned ON or the power supply is resumed.

- When the setting temperature is reached during heating operation, the compressor stops and it will not start for 4 minutes.

30 minutes Time Saved Control

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- The compressor will start automatically if it has stopped for 30 minutes even if the room temperature is below the compressor OFF temperature.

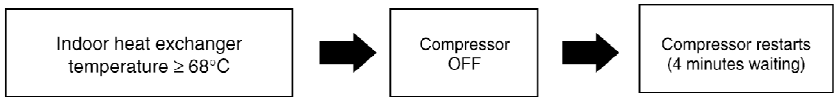
Overload Protection Control

- If the temperature of the Outdoor Heat Exchanger less than -3°C, Outdoor Fan is ON. The Outdoor Fan stop, when Outdoor Heat Exchanger temperature is T_b or more according to Outdoor Air Temperature region as table below:

Outdoor Air Temperature	<10°C	⩾10°C~15°C	⩾15°C~<20°C	⩾20°C~<25°C	⩾25°C	Outdoor Fan OFF
T_b	⩾5°C	⩾4°C	⩾3°C	⩾2°C	⩾1°C	

During starting of Heating mode and after deice, Outdoor Fan ON for 90 sec. (Hi).

- If the Indoor heat exchanger becomes 68°C or more, the compressor will stop and restart automatically. (Time Delay Safety Control - 4 minutes waiting)



4-way Valve Control

- 4-way valve ON during Heating operation, except deicing operation.

- When the unit is switched to “OFF” during Heating operation, 4-way valve stay at Heating position for 5 minutes.

Hot Start Control

When Heating operation starts, Indoor Fan will not start until the indoor heat exchanger reaches 30°C as diagram shown.

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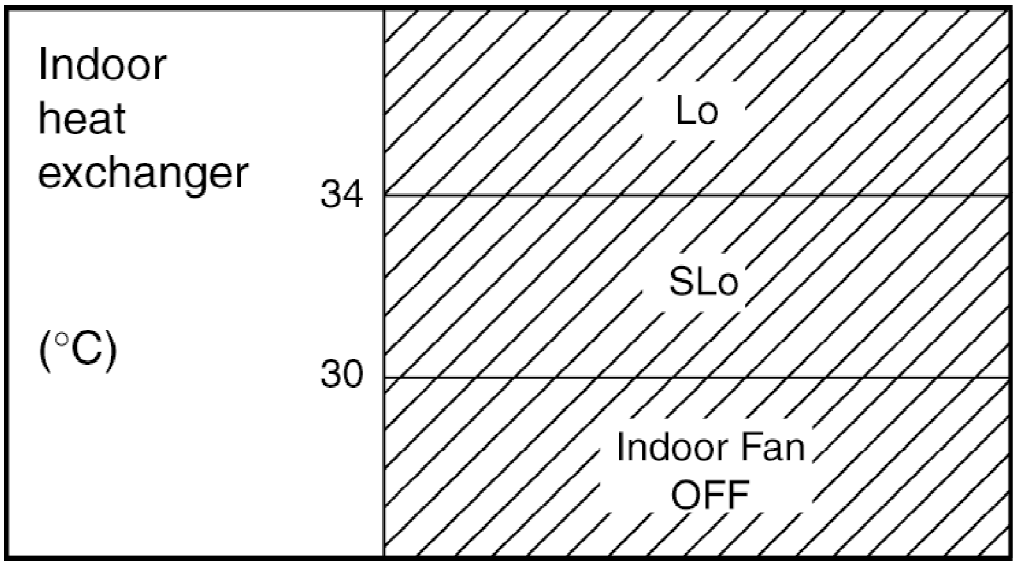

Hot Start is completed when indoor heat exchanger reaches 42°C.
Maximum Hot start duration = 4 minutes. After 4 minutes, Hot start operation will be shifted to normal Heating operation.

Automatic Fan Speed Mode

When Automatic Fan Speed is selected at Remote Control during heating operation.

- Fan speed rotates in the range of Hi → SLo according to the heat exchanger temperature.

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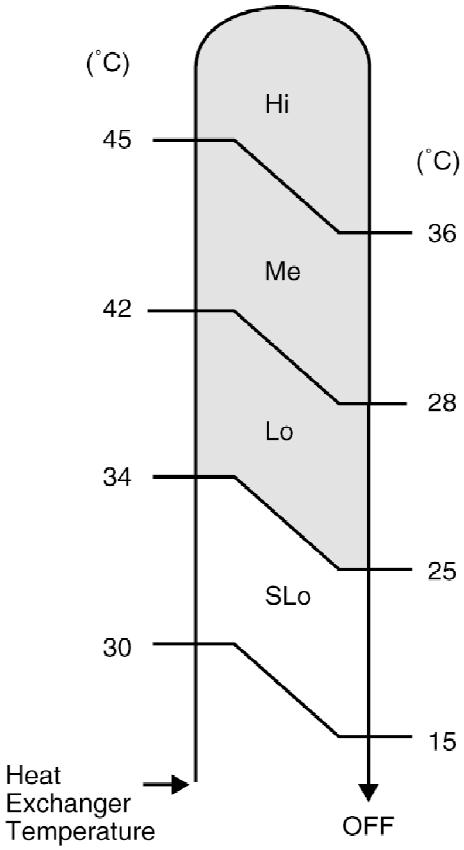

Manual Fan Speed Mode

Heating Operating Time Diagram

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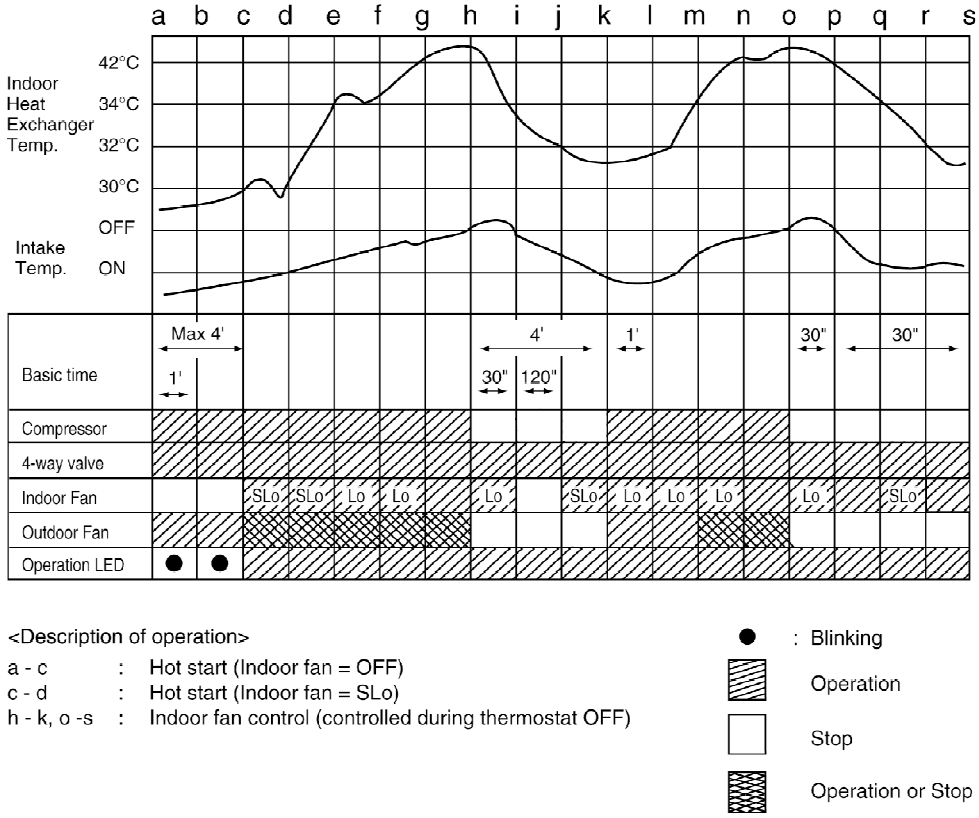

<Description of operation>

a - c : Hot start (Indoor fan = OFF)
c - d : Hot start (Indoor fan = SLo)
h - k, o -s : Indoor fan control (controlled during thermostat OFF)

Deicing Control

Deice starts to prevent frosting at outdoor heat exchanger.

- Normal Deicing

Deice operations detection commences in Heating operation starts or 60 minutes after previous deice operation. If the outdoor piping temperature drops to -4°C for 50 sec. continuously during compressor is in operation, deice will start.

(There is no detection during Outdoor Fan stops.)

- Overload Deicing

During heating operation, if the outdoor Fan OFF duration (due to overload control) is accumulated up to 60 minutes and after compressor starts for 1 minute, deicing starts.

- Deicing ends when

(a) 12 minutes after deicing operation starts;

(b) The outdoor piping temperature rises to about 12°C.

- After deicing operation, compressor stops for 30 seconds and 4-way valve stays at cooling position for 10 seconds.

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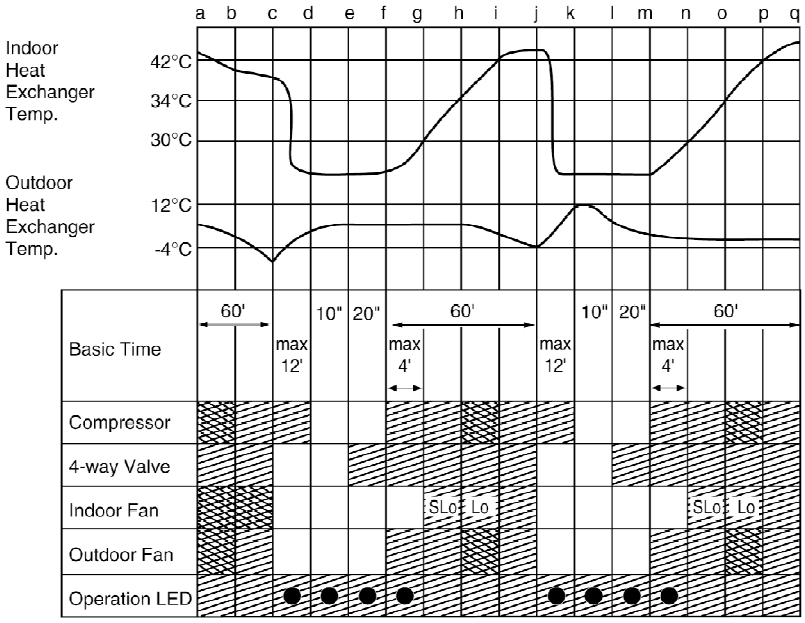
a) Normal Deicing Time Diagram

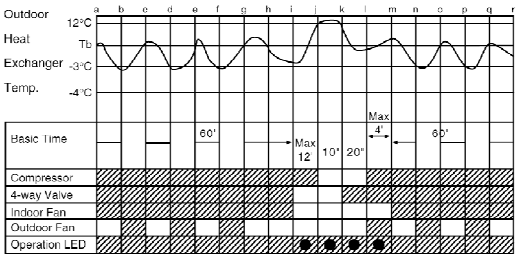


<Description of operation>

a - c : Deicing operation judging condition estabilished.
c - f : Deicing operation.
f - g : Hot start (add 4 minute delay timing)

● : Blinking
Operation
Stop
Operation or Stop

b) Overload Deicing Time Diagram



<Description of operation>

a - i : Overload control.
i - l : Overload deicing.
l - m : Hot start (add 4 minutes delay timing).
m - r : Overload control.

● : Blinking
Operation
Stop

8.4. Automatic Mode Operation

1. When the Automatic Mode Operation is selected, the indoor fan operates at SLo fan speed for 20 seconds to sense intake air temperature and determine the 1st operation mode.

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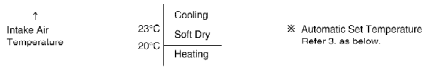
Standard for Determining Operation Mode 1st Judgement



2. Operation mode will be determine again after 1 hour of operation, if the room temperature reaches to set temperature and compressor off time is over 7 minutes 30 seconds continuously.

※Indoor intake air is less than 16°C, Heating mode will immediate operate. (only in the first time judgement)

※The present operation mode will be continued, if the room temperature does not reach to set temperature (Compressor keeps running) eventhough after 1 hour from automatic operation mode started.

For 2nd judgement onwards, indoor fan will operate for 20 seconds to sense the intake air temperature for determining operation mode.

Standard for Determining Operation Mode 2nd Judgement onwards

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Present Mode	Judgement	Next Mode		
		Cooling	Soft Dry	Hea
Cooling	23°C: Cooling / Heating	O (Judgement: 23°C & Above)	Not Applicable	C (Judge Below
Soft Dry	20°C: Soft Dry / Heating	Not Applicable	O (Judgement: 20°C & Above)	C (Judge Below
Heating	25°C: Cooling / Heating	O (Judgement: 25°C & Above)	Not Applicable	C (Judge Below

3. Automatic Set Temperature

For each operation, set temperature will automatically set as shown below.

However it can be selected 2°C higher or 2°C lower from standard set temperature by pressing the "Room Temperature Setting button".

Operation Mode	Higher	Standard	Lower
	(+2°C)	(±0°C)	(-2°C)
Cooling	27°C	25°C	23°C
Soft Dry	24°C	22°C	20°C
Heating	23°C	21°C	19°C

8.5. Sleep Mode Auto Operation

Cooling or Soft Dry Operation

When you press the SLEEP Mode, the following movement will start to avoid overcooling.

- **The fan speed refer to Indoor Fan Motor Control.**
- **The setting temperature will be risen by 0.5°C at the start of operation and by 0.5°C one hour later.**
- **The operation will stop after 8 hours.**
- **When using together with the Timer, the ON-Timer has priority.**

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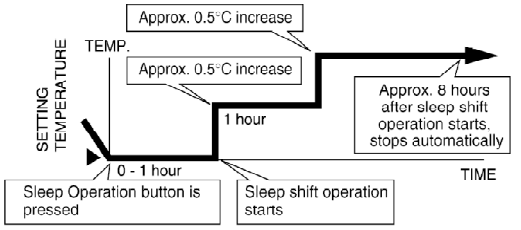
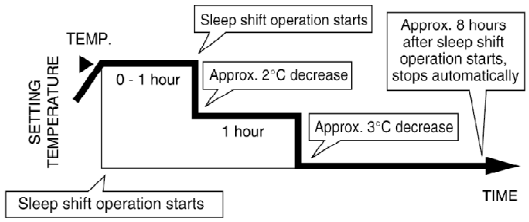
Heating Operation

When you press the SLEEP Mode, the following movement will start to avoid overheating.

- **The fan speed refer to Indoor Fan Motor Control.**
- **The setting temperature will be risen by 2°C at the start of operation and by 3°C one hour later.**
- **The operation will stop after 8 hours.**
- **When using together with the Timer, the ON-Timer has priority.**





8.6. Auto Restart Control

- **If there is a power failure, operation will be automatically restarted when the power is resumed.**
  It will start with previous operation mode and airflow direction.
  (Time Delay Safety Control is valid)
- **Auto Restart Control is not available when Timer or Sleep Mode is set.**
- **This control can be omitted by cutting the jumper wire J2. (Refer Circuit Diagram)**

8.7. Indoor Fan Speed Control

- **Auto Fan Speed Control**
  When set to Auto Fan Speed, the fan speed is adjusted between maximum and minimum setting as shown in the table.
- **Manual Fan Speed Control**

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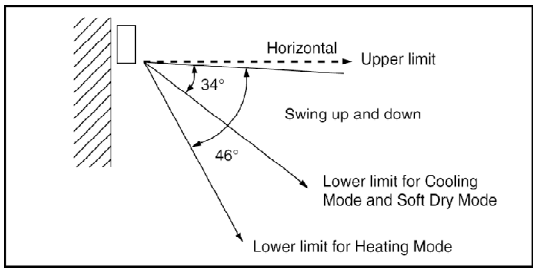
Basic fan speed adjustment (3 settings, from Lo to Hi) can be carried out by using the Fan Speed selection button.

Fan Speed		High Speed ← → Low Speed							
Cooling	Manual	O	O	O					
	Auto	O	O	O					O
	Sleep			O					
Soft Dry	Manual, Auto			O					O
	Sleep			O					
Heating	Manual	O	O	O					
	Auto	O	O	O	O	O			O
	Sleep			O	O	O			
		Hi	Me	Lo	SLo	SSLo			STOP

8.8. Airflow Direction Control

Airflow Direction Auto-Control

- When set a Airflow Direction Auto-Control with remote control, the louver swings up and down as shown in the diagram.
- The louver does not swing when the Indoor Fan stops during operation.
- When stopped with remote control, the discharge vent is closed with the louver.



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The left and right airflow direction louvers can be adjusted manually.

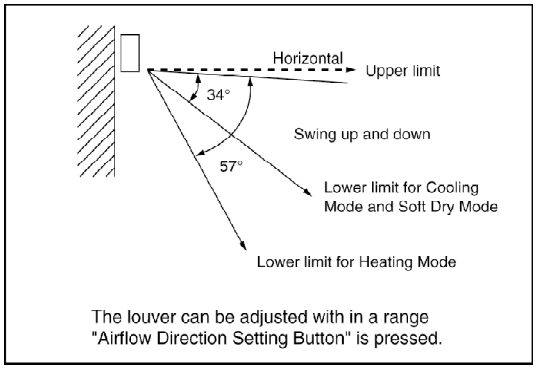
1 There is no swinging while indoor fan is stopped during Cooling and Soft Dry operation.

2 In Heating operation, when the indoor heat exchanger temperature rises to 38°C, the airflow direction is changed from upper limit to lower limit. When the indoor heat exchanger temperature falls to 35°C, the air flow direction is changed from lower limit to upper limit.

Airflow Direction Manual Control

- When the airflow direction set button is pressed, the automatic airflow is released and the airflow direction louver move up and down in the range shown in the diagram.
The louver can be stopped by releasing the button at the desired louver position.

- When the remote control is used to stop the operation, the discharge vent is closed with airflow direction louver.


Horizontal
Upper limit
34°
Swing up and down
57°
Lower limit for Cooling Mode and Soft Dry Mode
Lower limit for Heating Mode
The louver can be adjusted with in a range "Airflow Direction Setting Button" is pressed.

The left and right airflow direction louvers can be adjusted manually.

8.9. Delay ON Timer Control

- When the Delayed ON Timer is set by using the remote control, the unit will start operate slightly before the set time, so that the room will reach nearly to the set temperature by the desired time.

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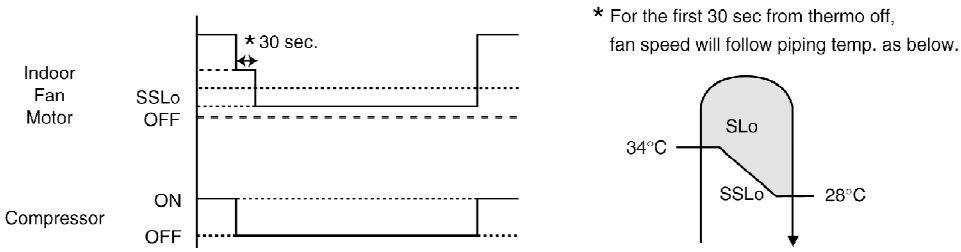
- For Cooling and Soft Dry mode, the operation will start 15 minutes before the set time.
- For Heating mode, the operation will start 30 minutes before the set time.
- For Automatic mode, the indoor fan will operate at SLo speed for 20 seconds, 30 minutes before the set time to detect the intake air temperature to determine the operation mode. The operation indication lamp will blink at this time.

8.10. Cold Draught Control



- When COMP = Thermal OFF, indoor fan speed immediately changed to SLo for 30 sec., followed by SSLo speed until COMP = ON.
  During cold draft c/m operation, fan speed will be SSLo only.
  SSLo: Fan will be running at Lo speed with SSR ON for 0.6 sec. and OFF for 5.0 sec.

9. Operating Instructions

10. Installation Instructions

Required tools for Installation Works			
1. Phillips screw driver	5. Spanner	9. Gas leak detector	13. Multimeter
2. Level gauge	6. Pipe cutter	10. Measuring tape	14. Torque wrench 18 N.m (1.8 kgf.m) 65 N.m (6.5 kgf.m)
3. Electric drill, hole core drill (ø70 mm)	7. Reamer	11. Thermometer	15. Vacuum pump
4. Hexagonal wrench (4 mm)	8. Knife	12. Megameter	16. Gauge manifold

10.1. Safety Precautions

- Read this following “SAFETY PRECAUTIONS” carefully before installation.

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- **Electrical work must be installed by all licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model to be installed.**
- **The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below.**
  Incorrect installation due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indication.

WARNING	**This indication shows the possibility of causing death or serious injury.**

CAUTION	**This indication shows the possibility of causing injury or damage to prop**

The items to be followed are classified by the symbols:

	Symbol with background white denotes item that is PROHBITED from pip

- **Carry out test running to confirm that no abnormality occurs after the installation. Then, explain to user the operation, care and maintenance as stated in instruction. Please remind the customer to keep the operating instructions for future reference.**

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⚠ WARNING

1. **Engage dealer or specialist for installation. If installation done by the user is defective, it will c water leakage, electrical shock or fire.**
2. **Install according to this installation instruction strictly. If installation is defective, it will cause leakage, electrical shock or fire.**
3. **Use the attached accessories parts and specified parts for installation. Otherwise, it will cause to fall, water leakage, fire or electrical shock.**
4. **Install at a strong and firm location which is able to withstand the set's weight. If the strength i enough or installation is not properly done, the set will drop and cause injury.**
5. **For electrical work, follow the local national wiring standard, regulation and this installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity enough or defect found in electrical work, it will cause electrical shock or fire.**
6. **Use the specified cable (2.5 mm^2) and connect tightly for indoor/outdoor connection. Connect and clamp the cable so that no external force will be acted on the terminal. If connection or fixi not perfect, it will cause heat-up or fire at the connection.**
7. **Wire routing must be properly arranged so that control board cover is fixed properly. If control cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electric**
8. **When carrying out piping connection, take care not to let air or other substances other than th specified refrigerant go into refrigeration cycle. Otherwise, it will cause lower capacity, abnorn pressure in the refrigerant cycle, explosion and injury.**
9. **Do not damage or use unspecified power supply cord. Otherwise, it will cause fire or electrical shock.**
10. **Do not modify the length of the power supply cord or use of the extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock.**

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⚠ CAUTION

1. **Grounding is necessary. It may cause electrical shock if grounding is not perfect.**
2. **Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.**
3. **Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, v may enter the room and damage the furniture.**

ATTENTION

1. **Selection of the installation location.**
   Select a installation location which is rigid and strong enough to support or hold the unit, and location for easy maintenance.
2. **Power supply connection to the room air conditioner.**
   Connect the power supply cord of the room air conditioner to the mains using one of the follo method.
   Power supply point shall be the place where there is ease for access for the power disconnect case of emergency.In some countries, permanent connection of this room air conditioner to th supply is prohibited.
   1. Power supply connection to the receptacle using a power plug. Use an approved 16A power plug with earth pin for the connection receptacle.
   2. Power supply connection to a circuit breaker for the permanent connection. Use an approved 16A circuit breaker for the permanen It must be a double pole switch with a minimum 3 mm contact gap.
3. **Do not release refrigerant.**
   Do not release refrigerant during piping work for installation, re-installation and during repairi refrigeration parts. Take care of the liquid refrigerant, it may cause frostbite.
4. **Installation work.**
   It may need two people to carry out the installation work.
5. **Do not install this appliance in a laundry room or other location where water may drip from the etc.**

Attached accessories

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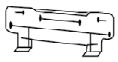
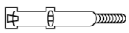
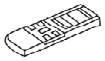
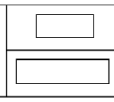
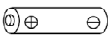
No.	Accesories part	Qty.	No.	Accessories part	Qty.
1	Installation plate 	1	6	Band 	2
2	Installation plate fixing screw	6	7	Remote control 	1
3	Vinyl tape 	3 1	8	Battery 	2
4	Screw for water proof cover	1	9	Air purifying filter	2
5	Water proof cover	1	10	Drain elbow	1

Applicable: Flaring piping kit CZ-52F

SELECT THE BEST LOCATION

INDOOR UNIT

- There should not be any heat source or steam near the unit.
- There should not be any obstacles blocking the air circulation.
- A place where air circulation in the room is good.
- A place where air drainage can be easily done.
- A place where noise prevention is taken into consideration.
- Do not install the unit near the door way.
- Ensure the spaces indicated by arrows from the wall, ceiling, or other obstacles.
- Indoor unit of this room air conditioner shall be installed on the wall in a height of at least 2.5 m.

OUTDOOR UNIT

- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- There should not be any animal or plant which could be affected by hot discharged air.
- Keep the spaces indicated by arrows from wall, ceiling, fence or other obstacles.

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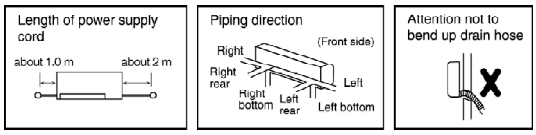
- **Do not place any obstacles which may cause a short circuit of the discharged air.**
- **If piping length is over 10 m, additional refrigerant should be added as shown in the table.**

Piping length and the elevation

Model	Pipe size		Max. Piping Length A (m)	Max. Elevation B (m)	Rated		Additional Refrigerant (g/m)
	Gas	/ / Liquid			/ Length	Elevation	
A281KR	5/8”	1/4”	30	25	7.5	5	40

Indoor/Outdoor unit installation diagram



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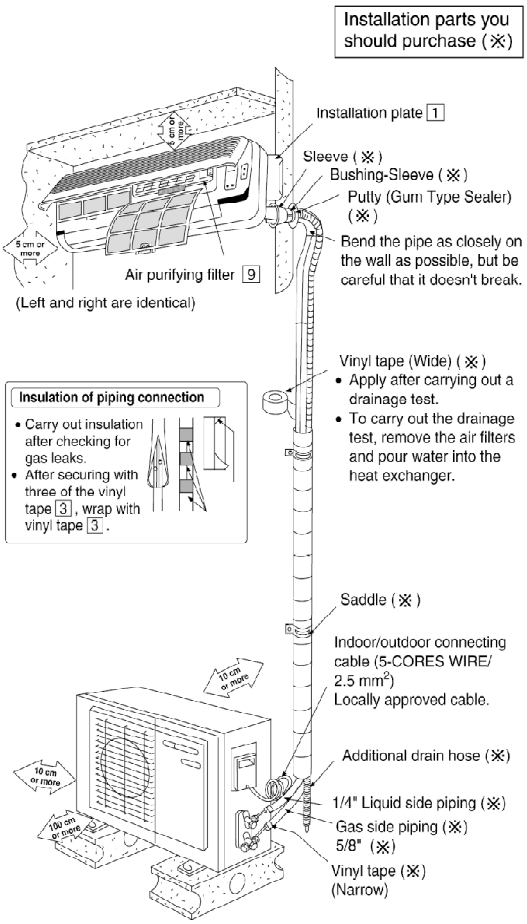

Installation parts you should purchase (※)
Installation plate 1
Sleeve (※)
Bushing-Sleeve (※)
Putty (Gum Type Sealer) (※)
Bend the pipe as closely on the wall as possible, but be careful that it doesn't break.
Air purifying filter 9
(Left and right are identical)
Vinyl tape (Wide) (※)
• Apply after carrying out a drainage test.
• To carry out the drainage test, remove the air filters and pour water into the heat exchanger.
Insulation of piping connection
• Carry out insulation after checking for gas leaks.
• After securing with three of the vinyl tape 3, wrap with vinyl tape 3.
Saddle (※)
Indoor/outdoor connecting cable (5-CORES WIRE/ 2.5 mm²) Locally approved cable.
Additional drain hose (※)
1/4" Liquid side piping (※)
Gas side piping (※) 5/8" (※)
Vinyl tape (※) (Narrow)

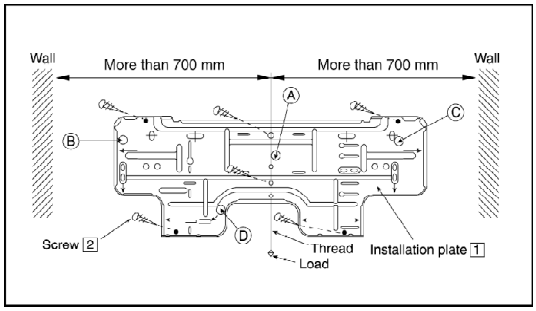
- This illustration is for explanation purposes only. / The indoor unit will actually face a different way.

10.2. INDOOR UNIT

10.2.1. SELECT THE BEST LOCATION / (Refer to “Select the best location” section)

10.2.2. HOW TO FIX INSTALLATION PLATE

The mounting wall is strong and solid enough to prevent it from the vibration.



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Ⓐ : Unit centre should be at more than 700 mm at right and left of the wall.
The height should be more than 250 mm from the ceiling.

Ⓑ : From installation plate end to unit left side end is 55 mm.

Ⓒ : From installation plate end to unit right side end is 55 mm.

Ⓓ : Indoor outdoor connecting cable should be about 1100 mm from this line. (Only for left rear piping)

1. Mount the installation plate on the wall with 6 screws. / (If mounting the unit on the concrete wall, consider using anchor bolts.)

   - Always mount the installation plate horizontally by aligning the marking-off line with the thread and using a level gauge.

2. Drill the piping plate hole with ø70 mm hole-core drill.

   - Line according to the arrows marked on the lower left and right side of the installation plate. The meeting point of the extended line is the centre of the hole.

   - Drill the piping hole at either the right or the left and the hole should be slightly slant to the outdoor side.

10.2.3. TO DRILL A HOLE IN THE WALL AND INSTALL A SLEEVE OF PIPING

1. Insert the piping sleeve to the hole.
2. Fix the bushing to the sleeve.
3. Cut the sleeve until it extrudes about 15 mm from the wall.

Caution
When the wall is hollow, please be sure to use the sleeve for tube ass'y to prevent dangers caused by mice biting the indoor/ outdoor connecting cable.

4. Finish by sealing the sleeve with putty or caulking compound at the final stage.

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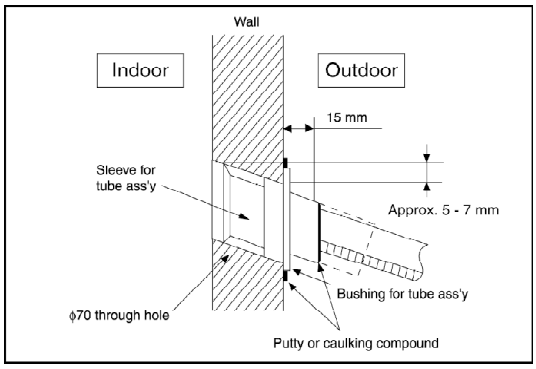

10.2.4. INDOOR UNIT INSTALLATION

1. For the right rear piping

Pull out the Indoor piping

↓

Install the Indoor Unit

↓

Secure the Indoor Unit

↓

Insert the indoor/outdoor connecting cable

2. For the right and right bottom piping

Pull out the Indoor piping

↓

Install the Indoor Unit

↓

Insert the indoor/outdoor connecting cable

↓

Secure the Indoor Unit

3. For the embedded piping

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Exchange the drain hose and the cap

↓

Bend the embedded piping

↓ • Use a spring bender or equivalent to bend the piping so that the piping is not crushed.

Install the Indoor Unit

↓

Cut and flare teh embedded piping

↓ • When determing the dimension of the piping, slide the unit all the way to the left on the installation plate.
Refer to the section "Cutting and flaring the piping".

Pull the indoor/outdoor connecting cable into Indoor Unit

↓ • The inside and outside indoor/outdoor connecting cable can be connected without removing the front grille.

Connect the piping

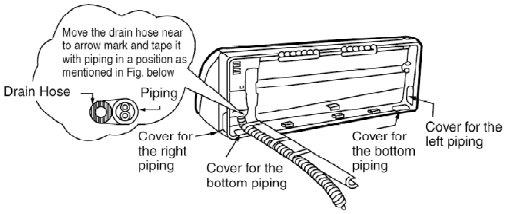
↓ • Please refer to "Connecting the piping" column in outdoor unit section. (Below steps are done after connecting the outdoor piping and gas-leakage confirmation.)

Insulate and finish the piping

↓ • Please refer to "Piping and finishing" column of outdoor section and "Insulation of piping connections" column as mentioned in Indoor/ Outdoor Unit Installation diagram.

Secure the Indoor Unit

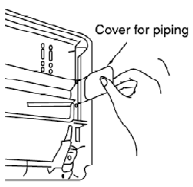
Pull out the piping and drain hose


Move the drain hose near to arrow mark and tape it with piping in a position as mentioned in Fig. below
Drain Hose
Piping
Cover for the right piping
Cover for the bottom piping
Cover for the bottom piping
Cover for the left piping

How to keep the cover

In case of the cover is cut, keep the cover at the rear of chassis as shown In the illustration for future reinstallation.

(Left, right and bottom covers for piping)



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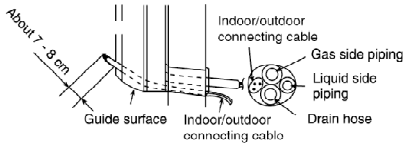
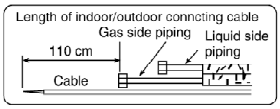
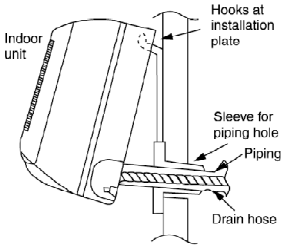
Insert the indoor/outdoor connecting cable





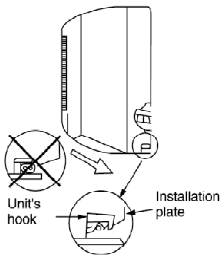
Install the indoor unit

Hook the indoor unit onto the upper portion of installation plate. (Engage the indoor unit with the upper edge of the installation plate). Ensure the hooks are properly seated on the installation plate by moving it in left and right.

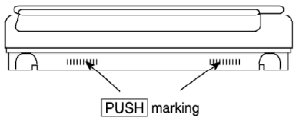


Secure the indoor unit

1. Tape the extra power supply cord in a bundle and keep it behind the chassis.
2. Press the lower left and right side of the unit against the installation plate until hooks engages with their slots (sound click).



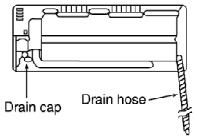
In case of to take out the unit, push the PUSH marking on the unit bottom, and pull it slightly towards you to disengage the hooks from the unit.

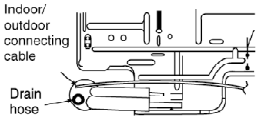


(This can be used for left rear piping and left bottom piping also.)

Exchange the drain hose and the cap

Refer view for left piping installation





Adjust the piping slightly downwards

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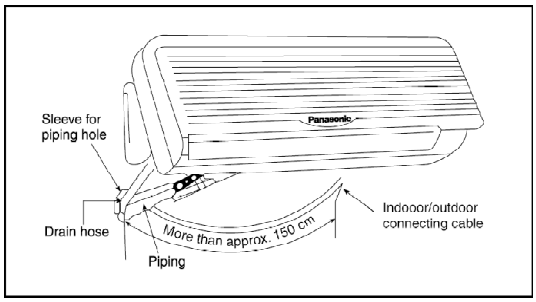
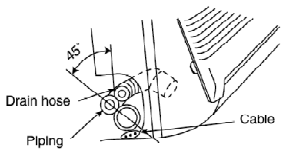
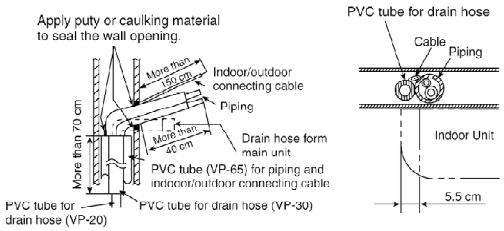


- In case of left piping how to insert the indoor/outdoor connecting cable and drain hose.



(For the right piping, follow the same procedure)

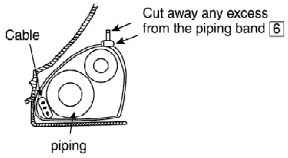
- In case of the embedded piping, how to pull the piping and drain hose out.


Apply putty or caulking material to seal the wall opening.
More than 150 cm
Indoor/outdoor connecting cable
Piping
More than 70 cm
More than 40 cm
Drain hose form main unit
PVC tube (VP-65) for piping and indoor/outdoor connecting cable
PVC tube for drain hose (VP-30)
PVC tube for drain hose (VP-20)
PVC tube for drain hose
Cable
Piping
Indoor Unit
5.5 cm

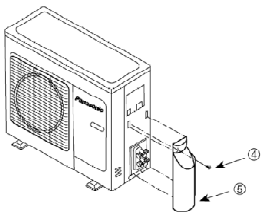
Be sure to insulate the PVC tube for drain hose

ATTACHMENT OF THE PIPING BAND

- Tighten the band so that the cable and the piping are secure. Be sure to cut any excess from the piping band (failure to cut away the excess piping band may produce abnormal noise during operation or condensation).



- The method of install water proof cover



- At first please fix the water proof cover on the cabinet then tighten the screw.

10.2.5. CONNECT THE CABLE TO THE INDOOR UNIT

1. The inside and outside indoor/outdoor connecting cable can be

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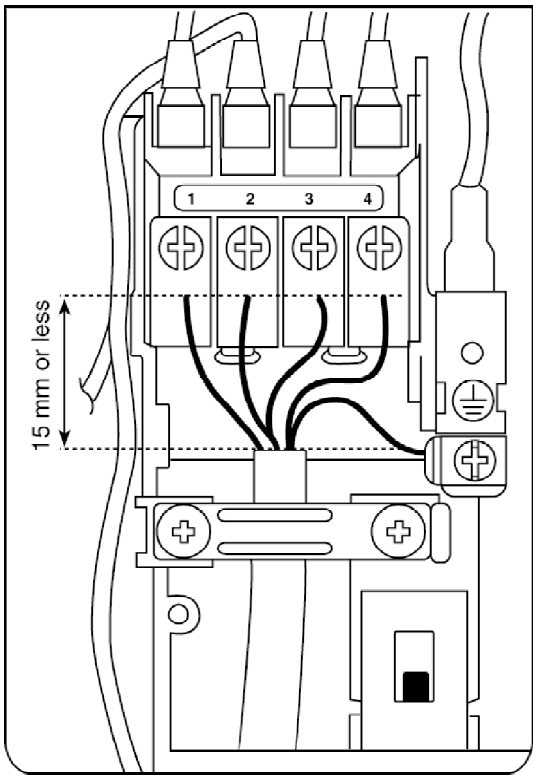
connected without removing the front grille.

2. **Indoor/outdoor connecting cable between indoor unit and outdoor unit shall be approved polychorprene sheathed 5 × 2.5 mm^2 flexible cord 245 IEC 57 (Rubber insulated cable GP 85PCP or HD 85PCP AS/NZS3191) or heavier cord.**
   Ensure the color of wires of outdoor unit and the terminal Nos. are the same to the Indoor's respectively.

Terminals on the indoor unit	1	2	3	4	⏚
Color of wires					
Terminals on the outdoor unit	1	2	3	4	⏚

- Secure the cable onto the control board with the holder (clamper).



INSTALLATION OF AIR PURIFYING FILTERS

1. **Open the front panel.**
2. **Remove the air filters.**
3. **Hold the catechin filters by their tabs and install as shown in the**

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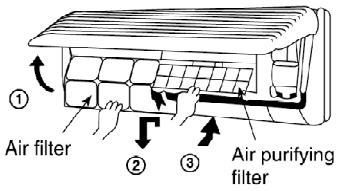
illustration at below.

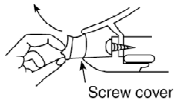


HOW TO TAKE OUT FRONT GRILLE

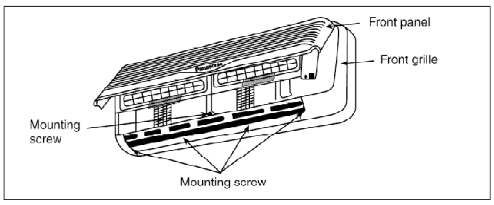
Please follow below steps to take out front grille if necessary such as when servicing. Remove the Grille from the chassis.

1. **Set the up-and-down air direction louver to open position (horizontally) by finger pressure.**

2. **Open the three screw covers as shown in the illustration below.**



3. **Remove the five mounting screws.**
4. **Open the front panel and remove a mounting screw at the centre. (Refer Diagram below)**
5. **To remove the Grille, pull the lower left and right side of the grille towards you (slightly tilted) and lift it straight upwards (Two tabs on the top inside edge of the grille are clear of their slots).**



When reinstalling the front grille, first set the vertical airflow direction louver to the horizontal position and then carry out above steps 2 - 5 in the reverse order.

REMOTE CONTROL NO. SWITCH

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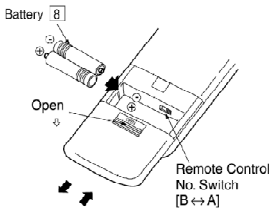
1. When installing two air conditioners in one room, each air conditioner can be synchronized to the remote controller.
2. In order to operate separately, open the rear cover of one of the remote controller and set the switch to “B”.
3. Also, set the remote control No. switch to “B” in the corresponding indoor unit.
   (The switch is located in the control box-sub. of the indoor unit.)



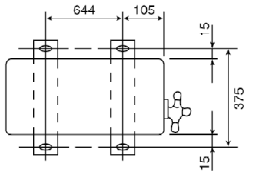
10.3. OUTDOOR UNIT

10.3.1. SELECT THE BEST LOCATION / (Refer to “Select the best location” section)

10.3.2. INSTALL THE OUTDOOR UNIT

- After selecting the best location, start installation according to Indoor/Outdoor Unit Installation Diagram.

1. Fix the unit on concrete or rigid frame firmly and horizontally by bolt nut. (ø10 mm).
2. When installing at roof, please consider strong wind and earthquake. Please fasten the installation stand firmly with bolt or nails.



10.3.3. CONNECTING THE PIPING

Connect Piping to Indoor

Please make flare after inserting flare nut (locate at joint portion of tube assembly) onto the copper pipe.

(In case of using long piping)

Connect the piping

- Align the center of piping and sufficiently tighten the flare nut with fingers.

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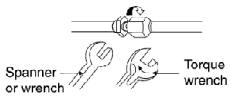
- Further tighten the flare nut with torque wrench in specified torque as stated in the table.

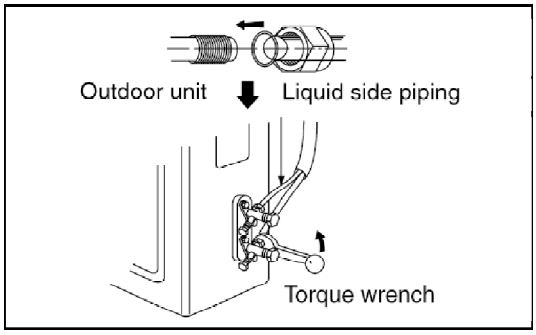


Model	Pipe size	Torque
A281KR	Liquid Side 1/4"	18 N.m
A281KR	Gas Side 5/8"	65 N.m

Connect the Piping to Outdoor Unit

1. **Align the center of the piping and sufficiently tighten the flare nut with fingers.**
2. **Finally, tighten the flare nut with torque wrench until the wrench clicks.**

- When tightening the flare nut with torque wrench, ensure the direction for tightening follows the arrow on the wrench.



CUTTING AND FLARING THE PIPING

1. **Please cut using pipe cutter and then remove the burrs.**
2. **Remove the burrs by using reamer. If burrs is not removed, gas leakage may be caused.**
   Turn the piping end down to avoid the metal powder entering the pipe.
3. **Please make flare after inserting the flare nut onto the copper pipes.**

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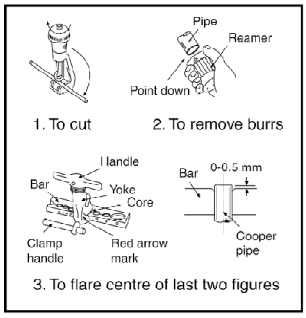
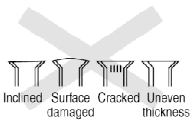


■ Improper flaring ■

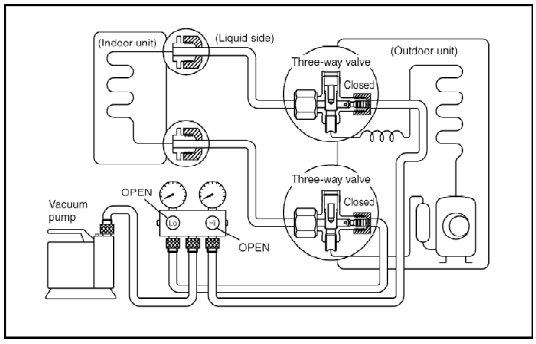


When properly flared, the internal surface of the flare will evenly shine and be of even thickness. Since the flare part comes into contact with the connectors, carefully check the flare finish.

10.3.4. EVACUATION OF THE EQUIPMENT

WHEN INSTALLING AN AIR CONDITIONER, BE SURE TO EVACUATE THE AIR INSIDE THE INDOOR UNIT AND PIPES in the following procedure.

If air remains in the indoor unit and refrigeration pipes, it will affect the compressor, reduce to cooling capacity, and could lead to a malfunction.



SERVICE PORT CAP

Be sure, using a torque wrench to tighten the service port cap (after using the service port), so that it prevents the gas leakage from the refrigeration cycle.

Procedure:

1. **Connect a charging hose with a push pin to the Low and High sides of a charging set and the service port of the 3-way valve.**
   - **Be sure to connect the end of the charging hose with the push pin to the service port.**
2. **Connect the center hose of the charging set to a vacuum pump.**
3. **Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa). Then evacuate the air approximately ten minutes.**
4. **Close the valve of both the Low and High sides of the charging**

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set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately five minutes.
Note: BE SURE TO TAKE THIS PROCEDURE IN ORDER TO AVOID REFRIGERANT GAS LEAKAGE.

5. Disconnect the charging hose from the vacuum pump and from the service port of the 3-way valve.
6. Tighten the service port caps of the 3-way valve at torque of 18 N.m with a torque wrench.
7. Remove the valve caps of both the 3-way valve. Position both of the valves to “OPEN” using a hexagonal wrench (4 mm).
8. Mount valve caps both of the 3-way valves.

- Be sure to check for gas leakage.

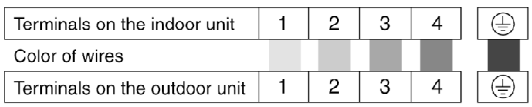
CAUTION

- If gauge needle does not move from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa), in step 3 above take the following measure:
- If the leak stops when the piping connections are tightened further, continue working from step 3.
- If the leak does not stop when the connections are retightened, repair the location of leak.

10.3.5. CONNECT THE CABLE TO THE OUTDOOR UNIT

(FOR DETAIL REFER TIO WIRING DIAGRAM AT UNIT)

1. Remove the control board cover from the unit by loosening the screw.
2. Indoor/outdoor connecting cable between indoor unit and outdoor unit shall be approved polychorprene sheathed 5 × 2.5 mm^2 flexible cord 245 IEC 57 (Rubber insulated cable GP 85PCP or HD 85PCP AS/NZS3191) or heavier cord.



3. Secure the cable onto the control board with the holder (clamper).
4. Attach the control board cover to the original position with the screw.

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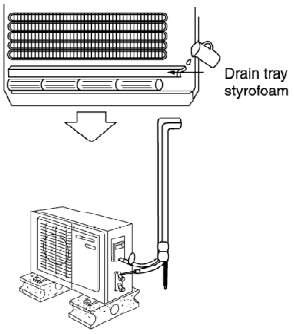
10.3.6. PIPE INSULATION

1. **Please carry out insulation at pipe connection portion as mentioned in Indoor/Outdoor Unit Installation Diagram. Please wrap the insulated piping end to prevent water from going inside the piping.**
2. **If drain hose or connecting piping is in the room (where dew may form), please increase the insulation by using POLY-E FOAM with thickness 6 mm or above.**

CHECK THE DRAINAGE

1. **Pour a glass of water into the drain tray-styrofoam.**
2. **Ensure if water flows out from drain hose of indoor unit.**



DISPOSAL OF OUTDOOR UNIT DRAIN WATER

- **If a drain elbow is used, the unit should be placed on a stand which is taller than 3 cm.**
- **If the unit is used in an area where temperature falls below 0°C for 2 or 3 days in succession, it is recommended not to use a drain elbow, for the drain water freezes and the fan will not rotate.**

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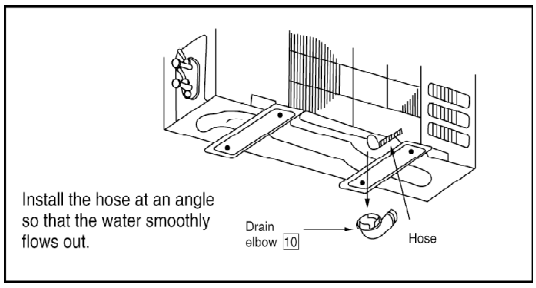
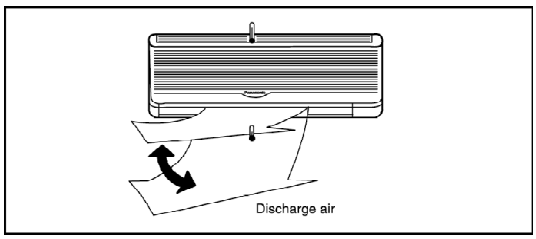


EVALUATION OF THE PERFORMANCE

1. **Operate the unit at cooling operation mode for fifteen minutes or more.**
2. **Measure the temperature of the intake and discharge air.**
3. **Ensure the difference between the intake temperature and the discharge is more than 8°C.**



CHECK ITEMS

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- [ ] **Is there any gas leakage at flare nut connections?**
- [ ] **Has the heat insulation been carried out at flare nut connection?**
- [ ] **Is the indoor/outdoor connecting cable being fixed to terminal board firmly?**
- [ ] **Is the indoor/outdoor connecting cable being clamped firmly?**
- [ ] **Is the drainage OK?**
  (Refer to “Check the drainage” section)
- [ ] **Is the earth wire connection properly done?**
- [ ] **Is the indoor unit properly hooked to the installation plate?**
- [ ] **Is the power supply voltage complied with rated value?**
- [ ] **Is there any abnormal sound?**
- [ ] **Is the cooling operation normal?**
- [ ] **Is the thermostat operation normal?**
- [ ] **Is the remote control’s LCD operation normal?**
- [ ] **Is the air purifying filter installed?**

11. 3-way Valve

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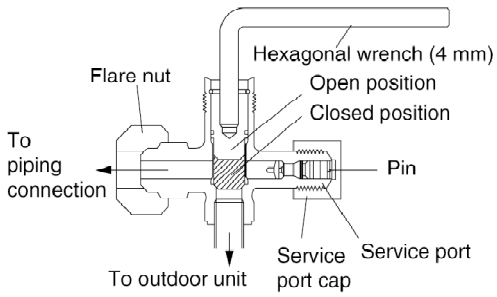
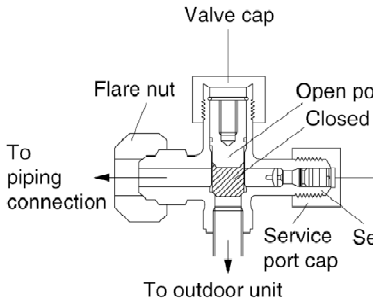
	3-way Valve (Liquid Side)		3-way Valve (Gas Side)	
				
Works	**Shaft Position**	**Service Port**	**Shaft Position**	**Servic**
Shipping	**Close (With valve cap)**	**Closed (With cap)**	**Closed (With valve cap)**	**Clos (With**
Evacuation (Installation and Re-installation)	**Closed (Clockwise)**	**Open (Connected manifold gauge w/charging cylinder)**	**Closed (Clockwise)**	**Op (Push**
Operation	**Open (With valve cap)**	**Closed (With cap)**	**Open (With valve cap)**	**Clos (With**
Pumping down (Transferring)	**Closed (Clockwise)**	**Closed (With cap)**	**Open (Counter-Clockwise)**	**Op (Conn manifolc**
Evacuation (Servicing)	**Open (Counter-Clockwise)**	**Open (Connected manifold gauge)**	**Open (Counter-Clockwise)**	**Op (Connecte gau**
Gas charging (Servicing)	**Open (Counter-Clockwise)**	**Open (Connected manifold gauge)**	**Open (Counter-Clockwise)**	**Op (Connecte gau**

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	3-way Valve (Liquid Side)		3-way Valve (Gas Side)	
Pressure check (Servicing)	**Open (Counter-Clockwise)**	**Open (Connected manifold gauge)**	**Open (Counter-Clockwise)**	**Op (Conn mani gau**
Gas releasing (Servicing)	**Open (Counter-Clockwise)**	**Open (Connected manifold gauge)**	**Open (Counter-Clockwise)**	**Op (Conn mani gau**

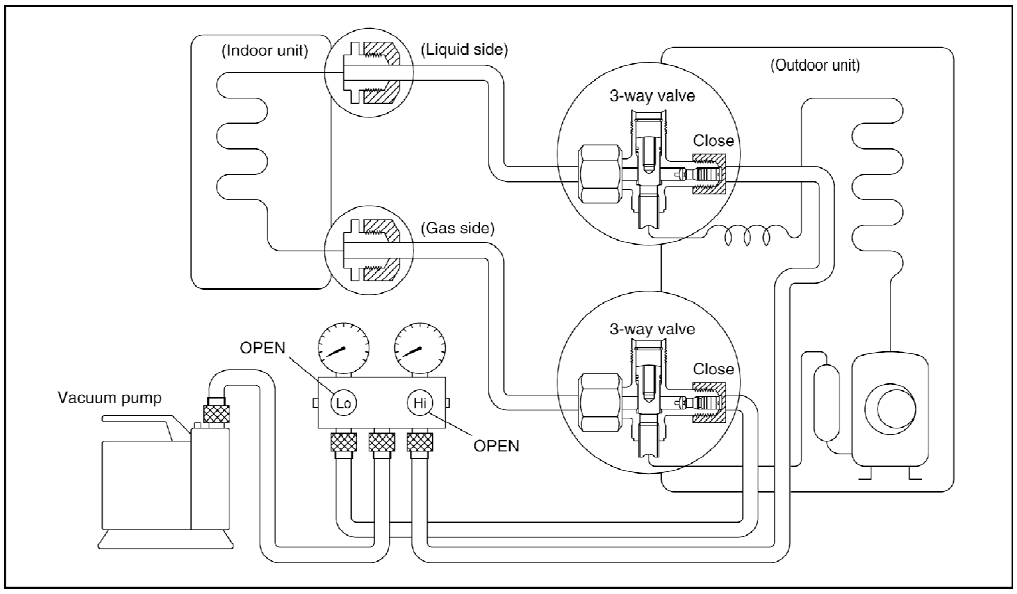
11.1. Evacuation of Installation

When installing an air conditioner, be sure to evacuate the air inside the indoor unit and pipes in the following procedure.

Required tools:

hexagonal wrench, adjustable wrench, torque wrenches, wrench to hold the joints, gas leak detector, and charging set.

The air in the indoor unit and in the piping must be purged. If air remains in the refrigeration pipings, it will affect the compressor, reduce the cooling capacity, and could lead to a malfunction.



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Service port cap

Be sure, using a torque wrench to tighten the service port cap (after using the service port), so th prevents the gas leakage from the refrigeration cycle

Procedure:

1. **Connect a charging hose with a push pin to the Low and High sides of a charging set and the service ports of a 3-way valve.**
   - **Be sure to connect the end of the charging hose with the push pin to the service port.**
2. **Connect the centre hose of the charging set to a vacuum pump.**
3. **Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa). Then evacuate the air for approximately 10 minutes.**
4. **Close the valve of both the Low and High sides of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately 5 minutes.**
   BE SURE TO TAKE THIS PROCEDURE IN ORDER TO AVOID REFRIGERANT GAS LEAKAGE.
5. **Disconnect the charging hose from the vacuum pump and from the service port of the 3-way valve.**
6. **Tighten the service port caps of both the 3-way valves at a torque of 18 N.m with a torque wrench.**
7. **Remove the valve caps of the 3-way valves. Position both of the valves to “open” using a hexagonal wrench (4 mm).**
8. **Mount the valve caps onto both of the 3-way valves.**
   - **Be sure to check for gas leakage.**

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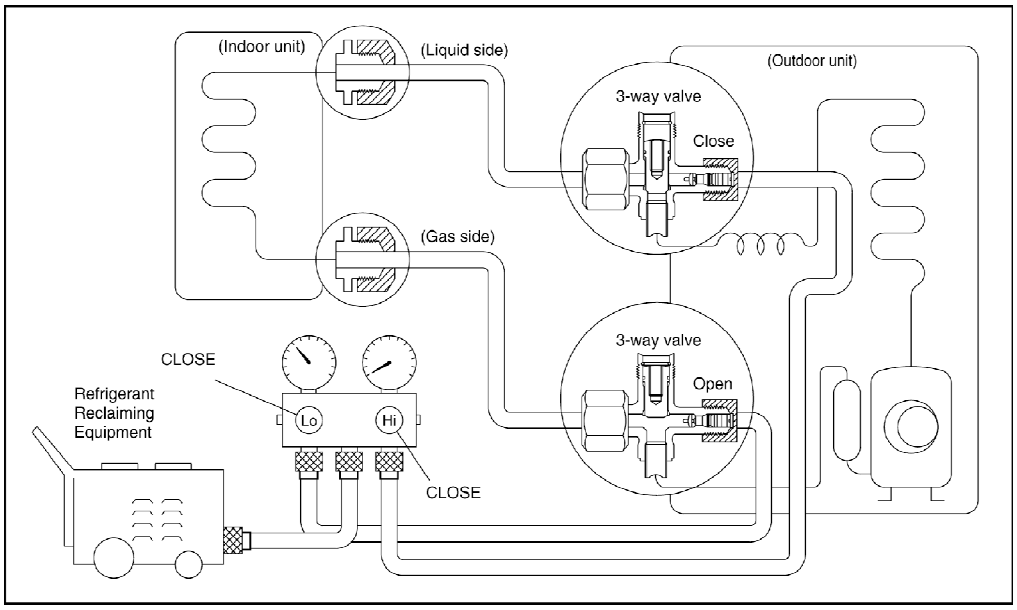
Caution

If gauge needle does not move from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa) in step (3) above, take the following measures:
If the leaks stop when the piping connections are tightened further, continue working from step (3).
If the leaks do not stop when the connections are retightened, repair the location of the leak.

11.2. Pumping down



Procedure:

1. Confirm that both the 3-way valves are set to the open position.

- **Remove the valve stem caps and confirm that the valve stems are in the open position.**
- **Be sure to use a hexagonal wrench to operate the valve stems.**

2. Operate the unit for 10 to 15 minutes.

3. Stop operation and wait for 3 minutes, then connect the charge

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set to the service port of the 3-way valve.

- Connect the charge hose with the push pin to the Gas side service port.

4. Air purging of the charge hose.

- Open the low-pressure valve on the charge set slightly to purge air from the charge hose.

5. Set the Liquid side 3-way valve to the close position.

6. Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0 kg/cm$_2$G (0 MPa).

- If the unit cannot be operated at the cool condition (weather is rather cool), press the Pump Down Switch on the Indoor unit.
- So that the unit can be operated.

7. Immediately set the gas side 3-way valve to the close position.

- Do this quickly so that the gauge ends up indicating 1 to 3 kg/ cm$_2$G (0.1 MPa to 0.3 MPa).

8. Use refrigerant reclaiming equipment to collect refrigerant from indoor unit and pipes.

9. Disconnect the charge set, and mount both the 3-way valve's stem nuts and the service port caps.

- Use a torque wrench to tighten the service port cap to a torque of 18 N.m.
- Be sure to check for gas leakage.

10. Disconnect pipes from indoor unit and outdoor unit.

11.3. Evacuation of Re-installation

WHEN REINSTALLING AN AIR CONDITIONER, BE SURE TO EVACUATE THE AIR INSIDE THE INDOOR UNIT AND PIPES in the following procedure.
If air remain in the indoor unit and refrigeration pipes, it will affect the compressor, reduce to cooling capacity, and could lead to a malfunction.

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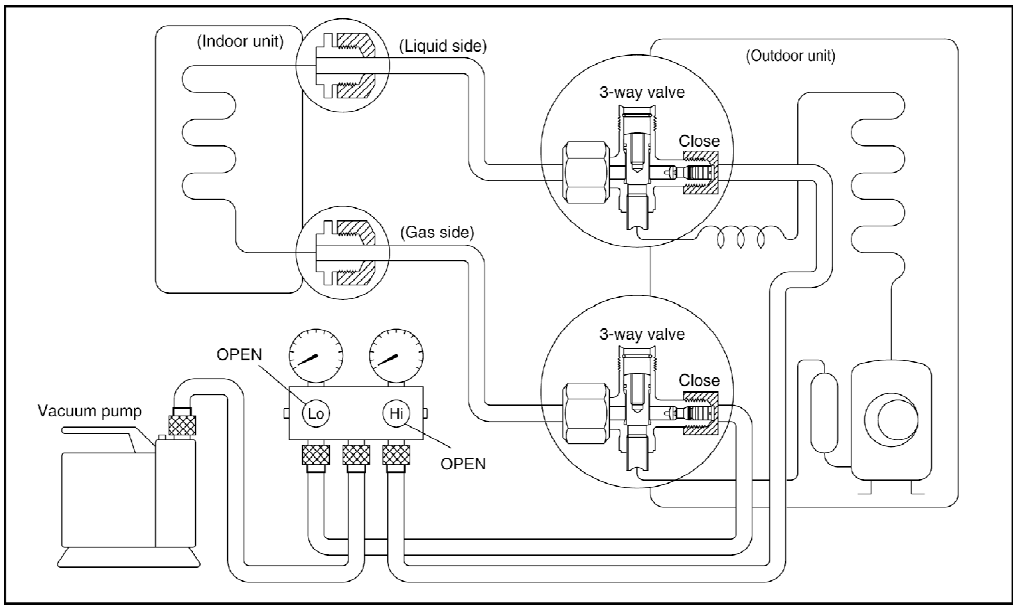

Procedure:

1. **Connect a charging hose with a push pin to the Low and High sides of a charging set and the service port of the 3-way valve.**

   - Be sure to connect the end of the charging hose with the push pin to the service port.

2. **Connect the centre hose of the charging set to a vacuum pump.**
3. **Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa). Then evacuate the air for approximately 10 minutes.**
4. **Close the valve of both Low side and High side of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately 5 minutes.**
   BE SURE TO TAKE THIS PROCEDURE IN ORDER TO AVOID REFRIGERANT GAS LEAKAGE.
5. **Disconnect the charging hose from the vacuum pump.**
6. **Charge the pipes and indoor unit with gas refrigerant from liquid (High) side 3-way valve service port and then discharge the refrigerant until gas (Low) side gauge needle indicates 3 kg/cm$_2$ (0.3 MPa).**

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- **BE SURE TO USE REFRIGERANT RECLAIMING EQUIPMENT WHILE DISCHARGING THE REFRIGERANT.**
- **Purge the air from charge set's centre hose.**
- **Be sure to check for gas leakage.**

Caution

If gauge needle does not move from 0 cmHg (0 MPA) to -76 cmHg (0.1 MPa) in step (3) above, take the following measures:
If the leaks stop when the piping connections are tightened further, continue working from step 3.
If the leaks do not stop when the connections are retightened, repair the location of the leak.

7. **Tighten the service port caps of both the 3-way valves at a torque of 18 N.m with a torque wrench.**
8. **Remove the valve caps of both the 3-way valves. Position both of the valves to "open" using a hexagonal wrench (4 mm).**
9. **Mount the valve caps onto the 3-way valves.**

11.4. Balance refrigerant of the 3-way valves

(Lack of refrigerant in the refrigeration cycle)

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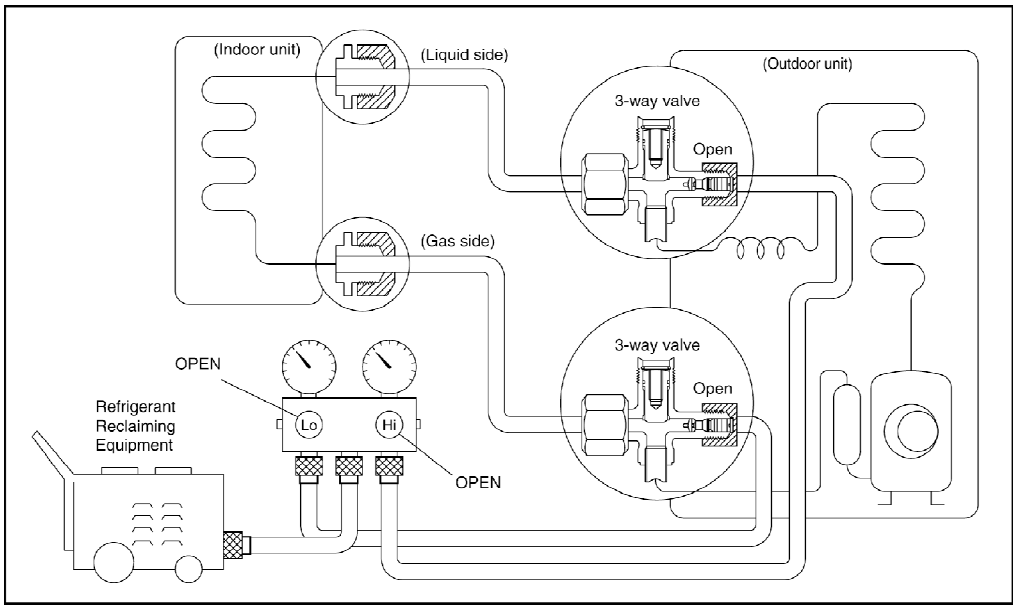

Procedure:

1. **Confirm that both the 3-way valves are set to the open position.**
2. **Connect the charge set to the 3-way valve's service port.**
   - **Leave the valve on the charge set closed.**
   - **Connect the charge hose with the push-pin to the service port.**
   - **Confirm whether the pressure indicates more than 0.1 MPa (1 kg/cm$_2$G).**
3. **Connect the charge set's centre hose to refrigerant reclaiming equipment.**
4. **Open the valve (Low side) on the charge set and loosen the hose connected with the Refrigerant Reclaiming Equipment to purge the air from the hose.**
5. **Turn on refrigerant reclaiming equipment to collect the refrigerant until the needle indicates 0 (no refrigerant is remaining).**

11.5. Evacuation

(No refrigerant in the refrigeration cycle)

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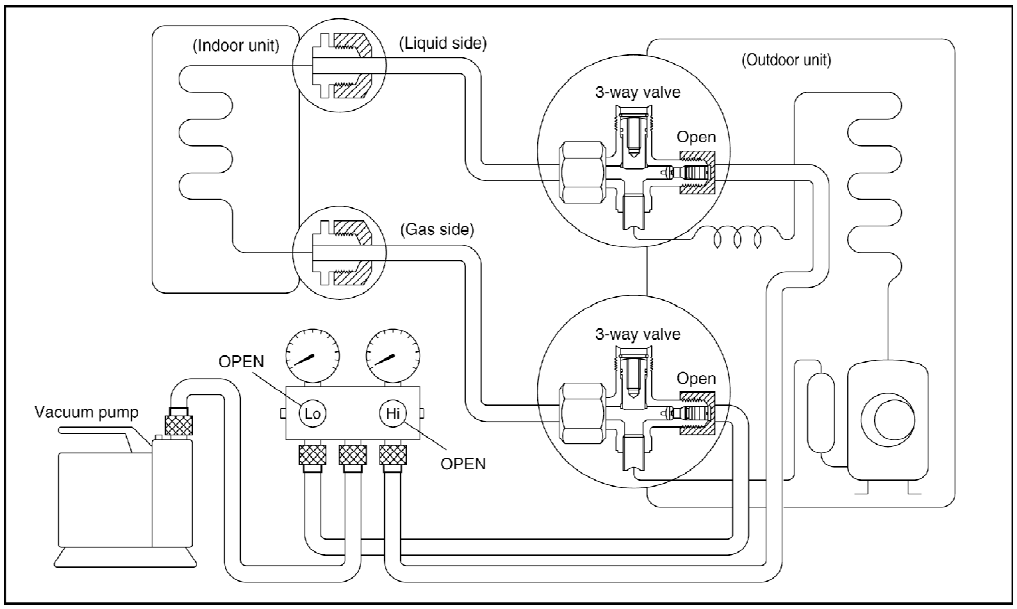

Procedure:

1. **Connect the vacuum pump to the charge set's centre hose.**
2. **Turn on the vacuum pump to evacuate the unit.**
   - **Confirm that the gauge needle has moved toward -76 cmHg (-0.1 MPa).**
   - **Apply the vacuum for approximately 1 hour (vacuum of 4 mmHg or less).**
3. **Close the valve (Low side and High side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after the vacuum pump is turned off).**
4. **Disconnect the charge hose from the vacuum pump.**

11.6. Gas charging

(After Evacuation)

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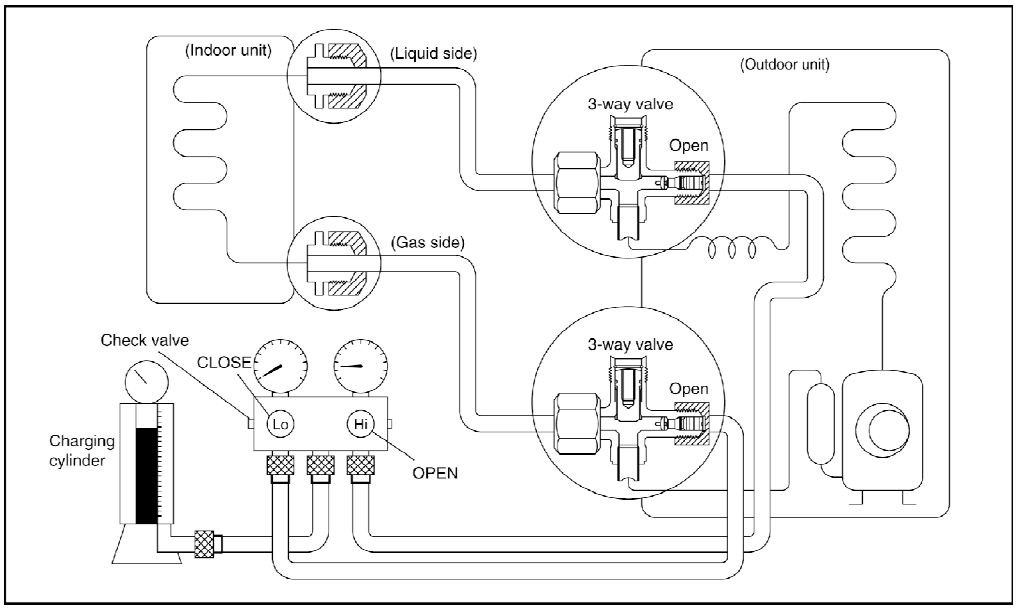

Procedure:

1. Connect the charge hose to the charging cylinder.

- Connect the charge hose which was disconnected from the vacuum pump to the valve at the bottom of the cylinder.

2. Purge the air from the charge hose.

- Open the valve at the bottom of the cylinder and use a screwdriver to press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3. Open the High side on the charge set and charge the refrigerant to the unit.

- Be sure to open only the High side valve on the charge set to charge the system from the liquid-side (high-presure) pipe. (If the system cannot be charged with the specified amount of refrigerant, operate the compressor until the specified amount can be charged, and then close the valve at the bottom of the charge cylinder.)

4. Immediately disconnect the charge hose from both the 3-way valve service ports.

5. Mount the valve stem nuts and the service port caps onto the 3-way valves.

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- Use torque wrench to tighten the service port caps to a torque of 18 N.m.
- Be sure to check for gas leakage.

12. Servicing Information

(A) Disassembly of the parts (Indoor Unit)

- Inspection points for the Indoor Electronic Controller

1. The Electronic Controller, a signal Receiver and an Indicator can be seen by removing the Front Grille and Control Board Cover, as shown in the .

- Indoor Fan Motor removal procedure:-

1. Remove the connector CN-C of Fan Motor and connector CN-STM of stepping motor from the electronic controller. Release the earth wire (YELLOW-GREEN) from the control board terminal and sensors from its holders. (Refer .)
2. Remove the Control Board.
   As shown in remove the 5 screws. Pull the control board forward slightly.

Caution:

Remove of Discharge Grille before removing the control board is necessary to avoid damaging other parts.

Fig. 1

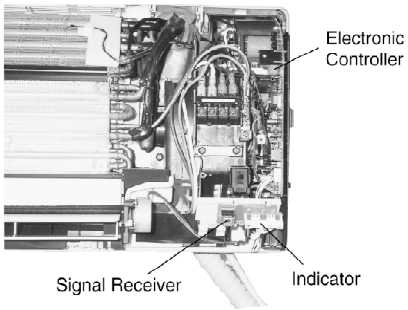

Fig. 2

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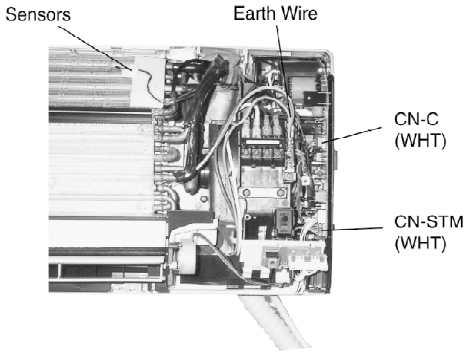
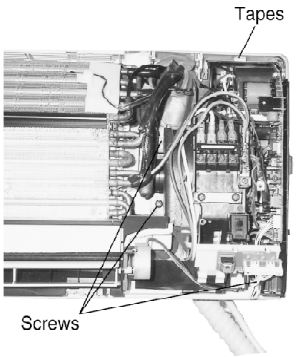


Fig. 3



3. Remove the Discharge Grille.

Remove the Discharge Grille and then pull the Discharge Grille in a down and forward direction.

4. Remove the Indoor Fan Motor.

Loosen the Fan Mounting Screw at the junction with Cross Flow Fan.

Loosen the screw at the left side of the evaporator.

Pull off the Bearing at the left of the Cross Flow Fan.

Fig. 4

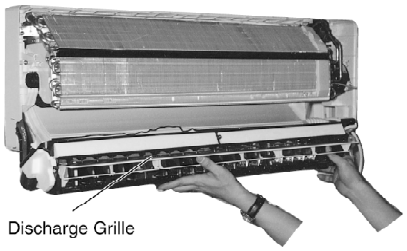


Fig. 5

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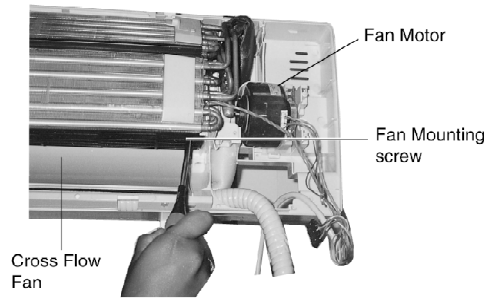


Fig. 6

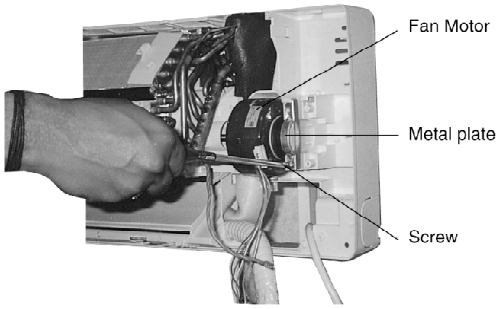
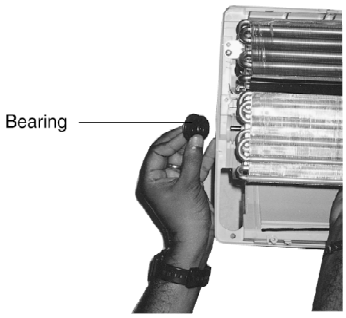


Fig. 7



- Cross Flow Fan Removal Procedure.

1. **(Refer to No. 4 of Indoor Fan Motor the removal procedure) Loosen the screw at the right side of the evaporator.**
2. **Pull the left side of the evaporator forward slightly and remove the cross Flow Fan.**

(B) Disassembly of the parts (Outdoor Unit)

- Inspection points for the Outdoor Electronic Controller

1. **The Electronic Controller, Can be seen by removing the cabinet Top plate and Front plate, as shown in the .**

Fig. 8

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Fig. 9

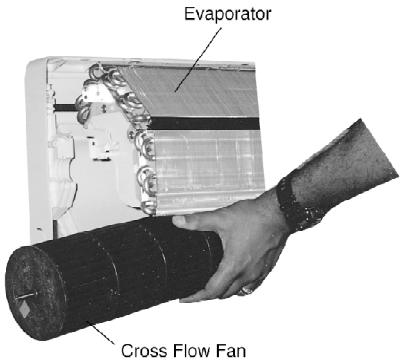
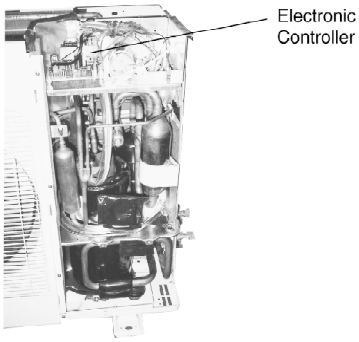


Fig. 10



(C) Remote Control Transmission Setting

- Remote Control Reset

When the batteries are inserted for the first time, or the batteries are replaced, all the indications will blink and the remote control might not work.

If this happen, remove the back cover of the remote control and you will find a resetting terminal, and by shorting it with a minus screwdriver, it will return to normal.

- Changing the wireless remote control transmission code

When two indoor units are installed in the same room, in order to

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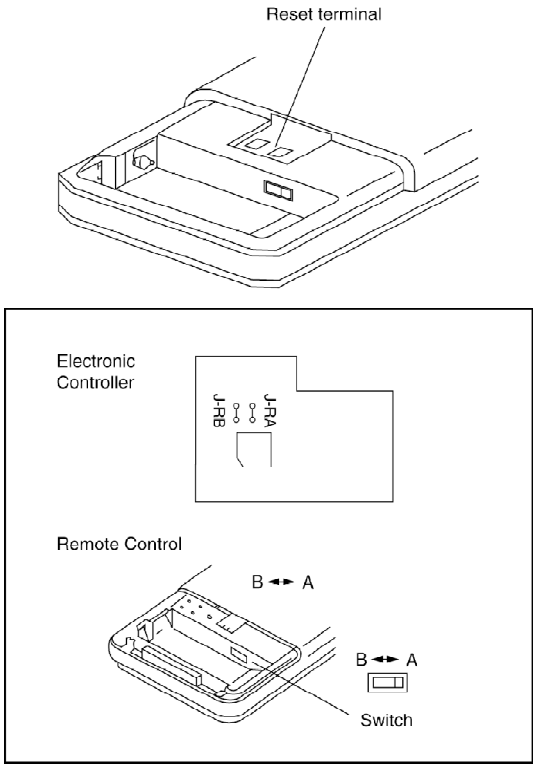
prevent operating errors caused by using two remote controls, set up the remote control [B ← → A] switch (SW1).
The unit is set to A when it is shipped.



- By adding a jumper wire to the remote control side and CUTTING J-RA, J-RB to the indoor printed circuit board, it is possible to select from 4 types of transmission codes including one at time of delivery condition (1).

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	Remote Control		Indoor printed circuit board		N
	Switch SW B ← → A	J - B	J - RA	J - RB	
1	A	——	SHORT	SHORT	At p de
2	B	——	SHORT	OPEN	
3	A	Jumper wire	OPEN	SHORT	
4	B	Jumper wire	OPEN	OPEN	

13. Troubleshooting Guide

13.1. Refrigeration cycle system

In order to diagnose malfunctions, make sure that there are no electrical problems before inspecting the refrigeration cycle. Such problems include insufficient insulation, problem with the power source, malfunction of a compressor and a fan.
The normal outlet air temperature and pressure of the refrigeration cycle depends on various conditions, the standard values for them are shown in the table to the right.

Normal Pressure and Outlet Air Temperature (Standard)

	Gas pressure MPa (kg/cm²G)	Outlet air temperature (°C)
Cooling Mode	0.4 ~ 0.6 (4 ~ 6)	12 ~ 16
Heating Mode	1.5 ~ 2.1 (15 ~ 21)	36 ~ 45

★ Condition: Indoor fan speed; High
Outdoor temperature 35°C at the cooling mode and 7°C at the heating mode

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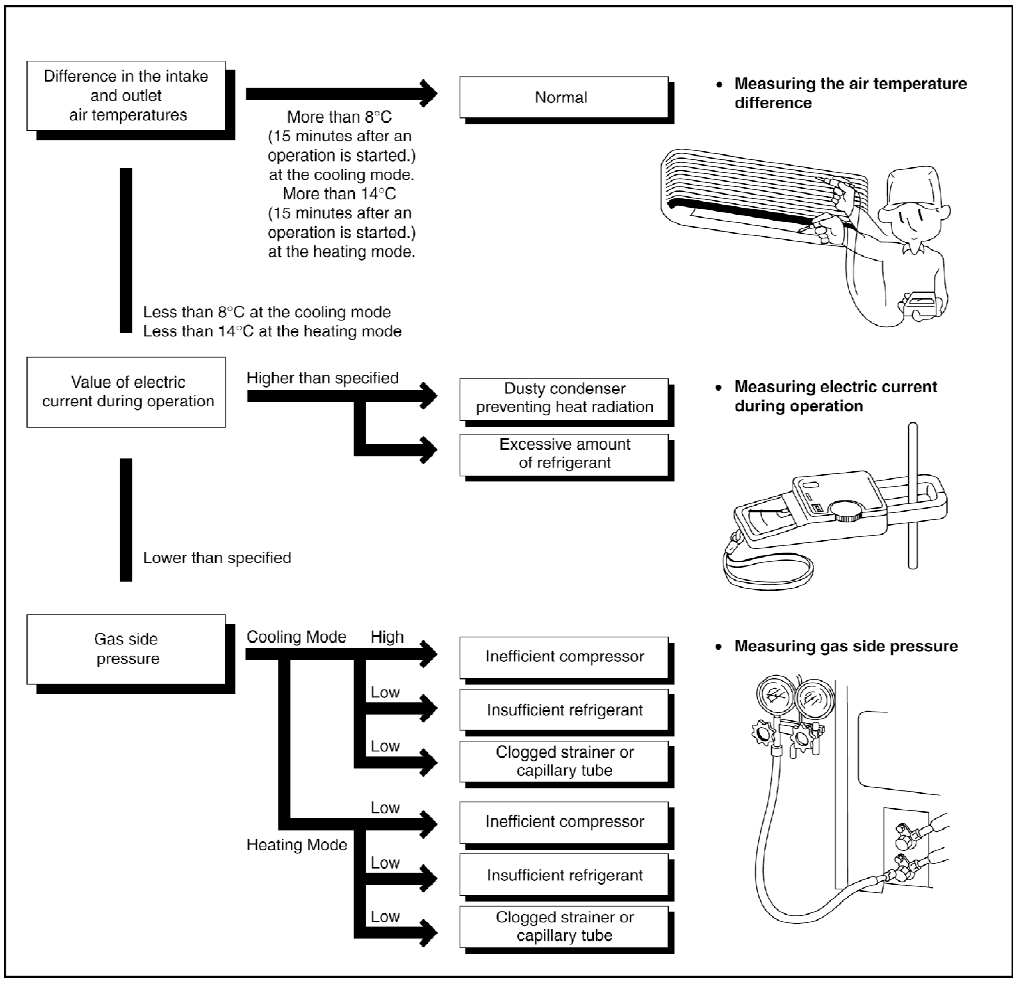
Difference in the intake and outlet air temperatures
More than 8°C (15 minutes after an operation is started.) at the cooling mode.
More than 14°C (15 minutes after an operation is started.) at the heating mode.
Normal
Less than 8°C at the cooling mode
Less than 14°C at the heating mode
• Measuring the air temperature difference
Value of electric current during operation
Higher than specified
Dusty condenser preventing heat radiation
Excessive amount of refrigerant
Lower than specified
• Measuring electric current during operation
Gas side pressure
Cooling Mode
High
Low
Low
Heating Mode
Low
Low
Low
Inefficient compressor
Insufficient refrigerant
Clogged strainer or capillary tube
Inefficient compressor
Insufficient refrigerant
Clogged strainer or capillary tube
• Measuring gas side pressure

13.1.1. Relationship between the condition of the air conditioner and pressure and electric current

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Condition of the air conditoner	Cooling Mode			Heating Mode		
	Low Pressure	High Pressure	Electric current during operation	Low Pressure	High Pressure	El cu du ope
Insufficient refrigerant (gas leakage)	↘	↘	↘	↘	↘	
Clogged capillary tube or Strainer	↘	↘	↘	↘	↘	
Short circuit in the indoor unit	↘	↘	↘	↗	↗	
Heat radiation deficiency of the outdoor unit	↗	↗	↗	↘	↘	
Inefficient compression	↗	↘	↘	↗	↘	

- Carry out the measurements of pressure, electric current, and temperature fifteen minutes after an operation is started.

13.1.2. Diagnosis methods of a malfunction of a compressor and 4-way valve

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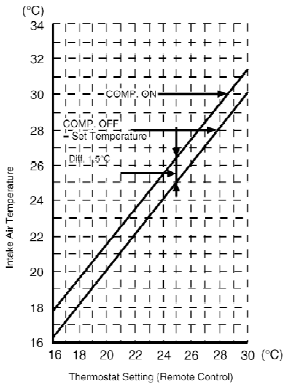
Nature of fault	Symptom
Insufficient compressing of a compressor	**-Electric current during operation becomes approximately 20% lower than the normal valu** **-The discharge tube of the compressor becomes abnormally hot (normally 70 to 90°C).** **-The difference between high pressure and low pressure becomes almost zero.**
Locked compressor	**-Electric current reaches a high level abnormally, and the value exceeds the limit of an am some cases, a breaker turns off.** **-The compressor is a humming sound.**
Inefficient switches of the 4-way valve	**-Electric current during operation becomes approximately 80% lower than the normal valu** **-The temperature difference between from the discharge tube to the 4-way valve and from tube to the 4-way valve becomes almost zero.**

14. Technical Data

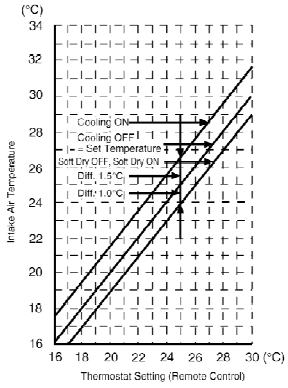
■ Thermostat characteristics

CS-A281KR

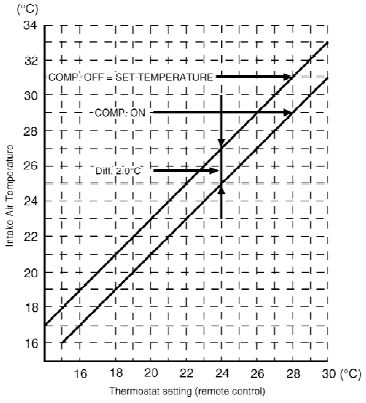
- **Cooling**



- **Soft Dry**



- **Heating**



■ Sensible Capacity Chart

CS-A281KR

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Cooling	Outdoor Temp. (°C)											
Indoor Wet Bulb Temp.	30			35			40			46		
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
17.0°C	7.74	6.91	2.43	7.36	6.77	2.62	6.89	6.30	2.80	6.24	5.43	3.02
19.0°C				8.00		2.65						
19.5°C	8.60	5.98	2.46	8.16	5.67	2.65	7.60	5.64	2.84	6.96	5.42	3.05
22.0°C	9.61	5.62	2.50	9.04	4.99	2.68	8.40	4.44	2.90	7.68	3.89	3.10

TC - Total Cooling/Heating Capacity (kW)
SHC - Sensible Heat Capacity (kW)
IP - Input Power (kw)

Indoor 27°C/19°C
Outdoor 35°C/24°C

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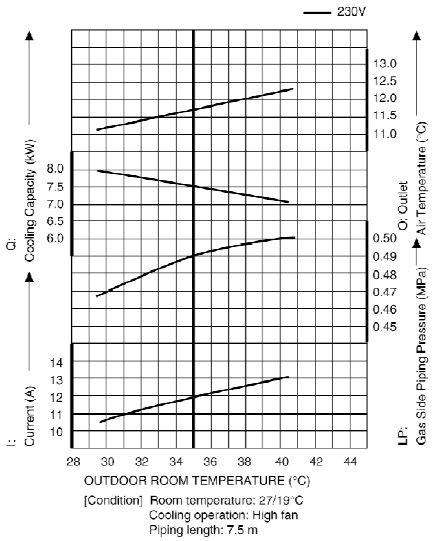
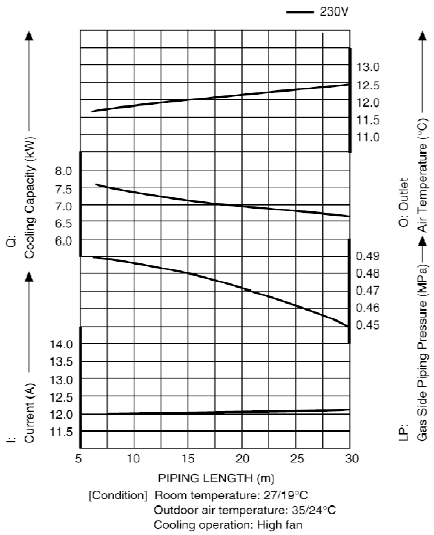
■ Operation characteristics

CS-A281KR.CU-A281KR

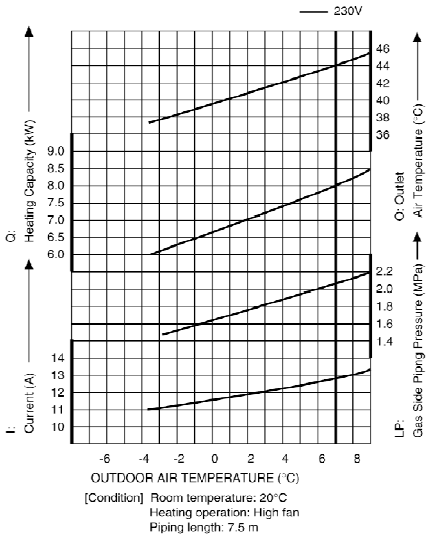
- **Cooling Characteristic**



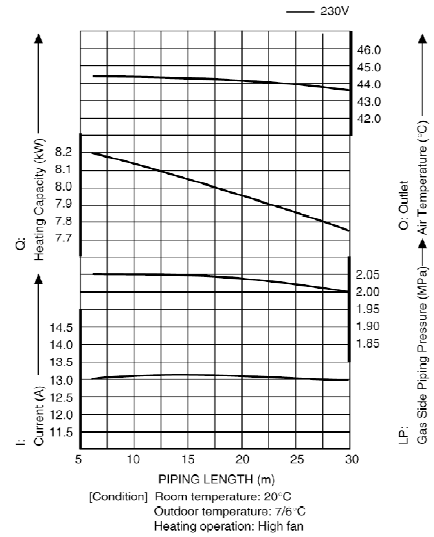
- **Piping Length Characteristic (Cooling)**



- **Heating Characteristic**



- **Piping Length Characteristic (Heating)**



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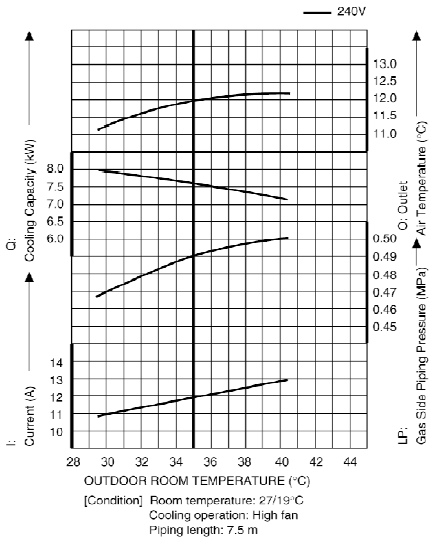
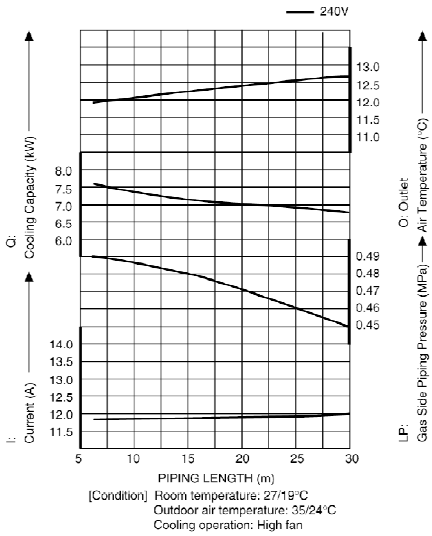
■ Operation characteristics

CS-A281KR.CU-A281KR

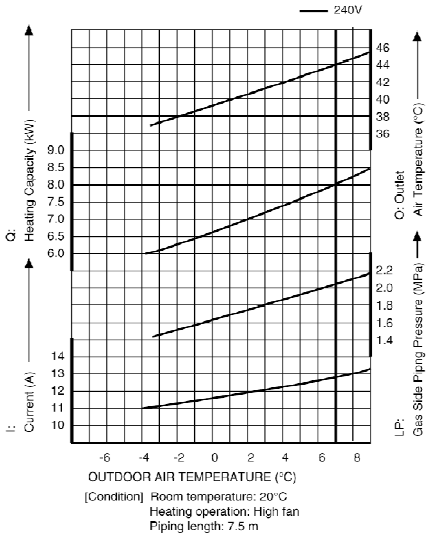
• **Cooling Characteristic**



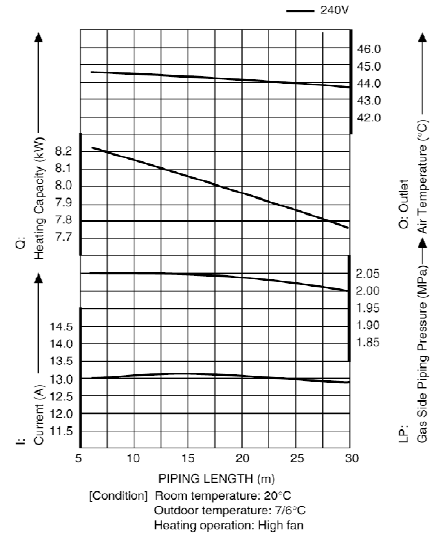
• **Piping Length Characteristic (Cooling)**



• **Heating Characteristic**



• **Piping Length Characteristic (Heating)**



15. Exploded View

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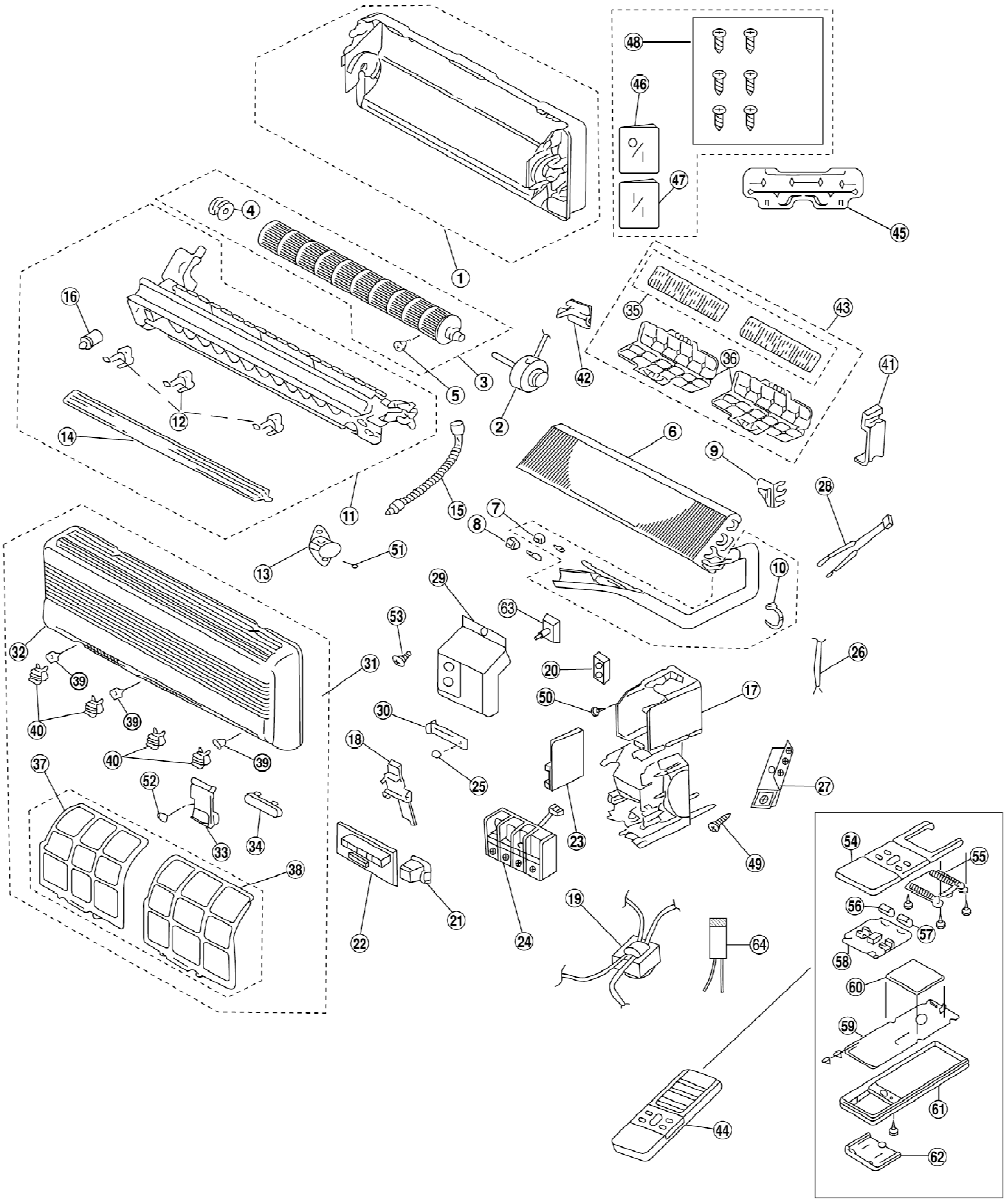

16. Replacement Parts List

<Model: CS-A281KR>

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NO	DESCRIPTION & NAME	QTY	CS-280KR	REMARKS
1	CHASSIS COMPLETE	1	CWD5239970C	●
2	FAN MOTOR	1	CWA4301370	■ ●
3	CROSS FLOW FAN COMPLETE	1	CWD5707210C	●
4	BEARING ASS'Y	1	CWH4059660K	●
5	SCREW (CROSS FLOW FAN)	1	CWH4582660	●
6	EVAPORATOR	1	CWB6305560	●
7	FLARE NUT (1/4")	1	CWT6002240	●
8	FLARE NUT (5/8")	1	CWT6002270	●
9	SENSOR HOLDER	1	CWH5040130	●
10	BAND (EVAPORATOR - TUBE ASS'Y COMPLETE)	1	CWH4620170	●
11	DISCHARGE GRILLE COMPLETE	1	CWD5011920C	●
12	FULCRUM	3	CWH4525110	●
13	MOTOR - AIR SWING	1	CWA4107010	■ ●
14	VANE AIR DEFLECTOR ASS'Y	1	CWH5050870K	●
15	DRAIN HOSE	1	CWH5881720	●
16	TAP - DRAIN TRAY	1	CWH4639770	●
17	CONTROL BOARD ASS'Y	1	CWH4719220K	●
18	PARTICULAR PLATE	1	CWH4945600	■ ●
19	TRANSFORMER	1	CWA4017690	■ ●
20	CIRCUIT ASS'Y (OPERATION BUTTON COMPLETE)	1	CWA3919420(D)K	■ ●
21	CIRCUIT ASS'Y (RECEIVER COMPLETE)	1	CWA3919420(C)K	■ ●
22	CIRCUIT ASS'Y (DISPLAY COMPLETE)	1	CWA3919420(B)K	■ ●
23	CIRCUIT ASS'Y (ELECTRONIC CONTROLLER)	1	CWA3919420(A)K	■ ●
24	TERMINAL BOARD ASS'Y	1	CWA4706600K	■ ●
25	SCREW	1	XTT4+14C	●
26	POWER SUPPLY COMPLETE	1	CWA4102330C	●
27	TERMINAL BOARD COMPLETE	1	CWA4706620C	●
28	SENSOR COMPLETE	1	CWA3900230C	■ ●
29	CONTROL BOARD TOP COVER	1	CWH4945590	●
30	HOLDER - P.S. CORD	1	CWH4627040	●
31	FRONT GRILLE COMPLETE	1	CWE5053360C	■ ●
32	INTAKE GRILLE COMPLETE	1	CWE5010960C	●
33	DOOR	1	CWE5002270	●
34	DECORATING PLATE COMPLETE	1	CWE5027410C	●
35	AIR PURIFYING FILTER	2	CZ-SFD30N	■ ●
36	AIR PURIFYING FILTER (FRAME)	2	CWDPRT-90026-1	●
37	AIR FILTER (LEFT)	1	CWD4209180	■ ●
38	AIR FILTER (RIGHT)	1	CWD4209180	■ ●
39	SCREW - FRONT GRILLE	4	XTT4+16C	●

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NO	DESCRIPTION & NAME	QTY	CS-280KR	REMARKS
40	CAP (FRONT GRILLE COMPLETE)	4	CWH5060060	●
41	PARTICULAR PLATE	1	CWH4945610	●
42	RAIN COVER (HOLDER - EVAPORATOR TUBE ASS'Y	1	CWH4631410	●
43	BAG COMPLETE (AIR PURIFYING FILTER)	1	CWE4649570C	●
44	REMOTE CONTROL COMPLETE ASS'Y	1	CWA75C556	■ ▲
45	INSTALLATION PLATE	1	CWH8010540	●
46	OPERATING INSTRUCTIONS	1	CWF8036900	●
47	INSTALLATION INSTRUCTIONS	1	CWF8039140	●
48	BAG COMPLETE - INSTALLATION SCREW	1	CWH4649210	●
49	SCREW	1	XTT4+12C	●
50	SCREW	1	XTT4+16C	●
51	SCREW	1	XTN4+8C	●
52	SCREW	1	XTT4+10C	●
53	SCREW	1	XTT4+8C	●
54	REMOTE CONTROL UPPER CASE	1	CWE15C241	▲
55	CONTROL PANEL	1	CWE311064	▲
56	KNOB	1	CWE17196A	▲
57	KNOB	1	CWE17197A	▲
58	CONTACTOR	1	CWA65036C	▲
59	ELECTRONIC CONTROLLER	1	CWA74224	▲
60	INDICATOR	1	CWE39199	▲
61	REMOTE CONTROL LOWER CASE	1	CWE15128A	▲
62	COVER	1	CWB80040A	▲
63	CAP (BUTTON)	1	CWE5060120	■ ▲
64	FUSE COMPLETE	1	CWA4023070C	■ ▲

(Note)

- " ■ " marked parts are recommended to be kept in stock.

- " ● " marked parts are supplied from TAMACO, Taiwan.

- " ▲ " marked parts are supplied from MACC, Malaysia.

17. Exploded View

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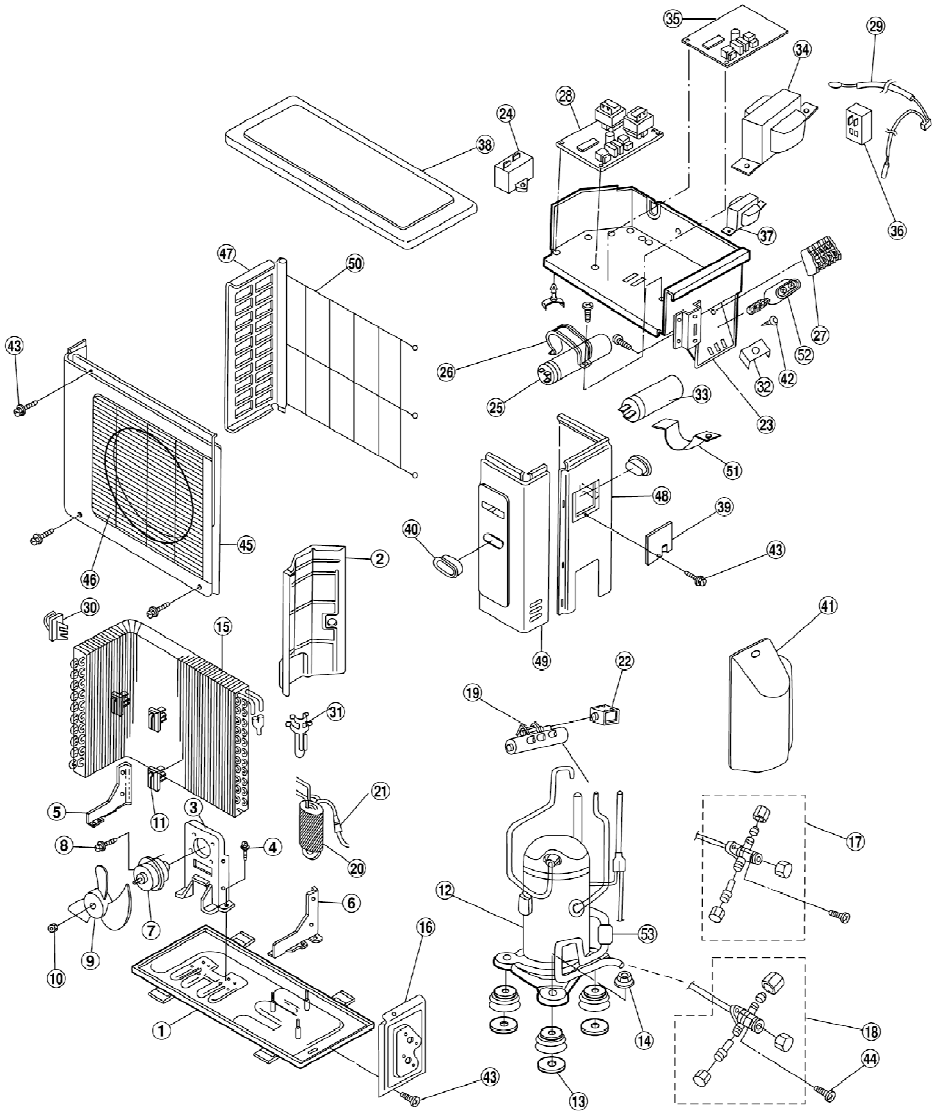

18. Replacement Parts List

<Model: CU-A281KR>

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NO	DESCRIPTION & NAME	QTY	CS-280KR	REMARKS
1	CHASSIS ASS'Y	1	CWH5244200AKA	●
2	SOUND PROOF	1	CWH5236060	●
3	FAN MOTOR BRACKET	1	CWH5241830	●
4	SCREW - (FAN MOTOR BRACKET)	6	XTT4D10CXW	●
5	PARTICULAR PLATE - LEFT (HOLD - FAN MOTOR)	1	CWH4934850	●
6	PARTICULAR PLATE - RIGHT (HOLD - FAN MOTOR)	1	CWH4934860	●
7	FAN MOTOR	1	CWA4301380	■ ●
8	SCREW - FAN MOTOR	3	XTT4D10CXW	●
9	PROPELLER FAN ASS'Y	1	CWH00K050	▲
10	NUT - PROPELLER FAN	1	CWH4583020	●
11	HOLDER - FOR F/MOTOR & LEAD WIRES	3	CWH4620110	●
12	COMPRESSOR ASS'Y	1	CWB6815280K	■ ●
13	PACKING - COMP. MOUNT	3	CWH4604010	●
14	NUT - COMP. MOUNT	3	CWH4521130	●
15	CONDENSER	1	CWB6305570	●
16	HOLDER - COUPLING ASS'Y	1	CWH5240070AKA	●
17	3-WAYS VALVE (LIQUID)	1	CWB4034150	■ ●
18	3-WAYS VALVE (GAS)	1	CWB4034170	■ ●
19	4-WAYS VALVE ASS'Y	1	CWB4034590K	■ ●
20	TUBE ASS'Y (CAPILLARY TUBE. CHECK VALVE)	1	CWB5932090	●
21	STRAINER	1	CWB4042340	●
22	V-COIL COMPLETE	1	CWA4019380C	■ ●
23	CONTROL BOARD ASS'Y	1	CWH4712690	●
24	CAPACITOR - FAN MOTOR	1	CWA4069960	■ ●
25	CAPACITOR - COMPRESSOR	1	CWA4069780	■ ●
26	HOLDER - CAPACITOR	1	CWH4828750	●
27	TERMINAL BOARD ASS'Y	1	CWA4706590	■ ●
28	ELECTRONIC CONTROLLER	1	CWA741315	■ ▲
29	SENSOR COMPLETE	1	CWA50C622	■ ▲
30	HOLDER - SENSOR	1	CWH32089	●
31	HOLDER - SENSOR (FOR TUBE)	1	CWH5040120	●
32	U METAL PIECE	1	CWE4825120	■ ●
33	CAPACITOR - COMPRESSOR START	1	CWA4069970	■ ●
34	INDUCTOR	1	CWA3915030	●
35	SOFT START ELECTRONIC CONTROLLER	1	CWA3919400	●
36	TERMINAL BOARD ASS'Y	1	CWA4706610K	●
37	TRANSFORMER	1	CWA4017740	●
38	CABINET TOP PLATE ASS'Y	1	CWE5030520AKA	●

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NO	DESCRIPTION & NAME	QTY	CS-280KR	REMARKS
39	CONTROL BOARD COVER	1	CWE4936960A	●
40	HANDLE	2	CWE4520120	●
41	RAIN COVER	1	CWE4631880	●
42	SCREW	1	XSD4+6BNS	●
43	SCREW	20	CWE4585520	●
44	SCREW	4	CWE4580930	●
45	CABINET FRONT PLATE ASS'Y COMPLETE	1	CWE5030940ACA	●
46	WIRE NET	1	CWE4537630	●
47	CABINET SIDE PLATE (LEFT)	1	CWE5030720A	●
48	CABINET REAR PLATE COMPLETE	1	CWE5030820ACA	●
49	CABINET FRONT PLATE ASS'Y	1	CWE5030640K	●
50	WIRE NET (REAR)	1	CWE4537530A	●
51	HOLDER - CAPACITOR	1	CWH4828800	●
52	HOLDER - PS,CORD	1	CWH4627100	●
53	MUFFLER	1	CWB6040210	●

(Note)

- " ■ " marked parts are recommended to be kept in stock.

- " ● " marked parts are supplied from TAMACO, Taiwan.

- " ▲ " marked parts are supplied from MACC, Malaysia.

19. Electronic Parts List

Electronic Controller: C3919-420A (CS-A281KR)

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SYMBOL	DESCRIPTION & NAME	PART NO.
IC1	INTEGRATED CIRCUIT	C4083-910
IC2	INTEGRATED CIRCUIT	C4083-450
IC3	INTEGRATED CIRCUIT	C4083-860
IC4	INTEGRATED CIRCUIT	C4083-730
IC5	INTEGRATED CIRCUIT	C4083-720
PC1	PHOTO COUPLER	C4094-040
Q1	TRANSISTOR	C4086-060T
Q2	TRANSISTOR	C4086-240T
Q3, Q5	TRANSISTOR	J4086-080T
D1 ~ D4	DIODE	E4060-020T
ZD1	ZENER DIODE	C4082-100T
ZNR1, ZNR2, ZNR3	ZNR	C4084-150
RY-HOT	RELAY ELECTRO MAGNETIC	C4104-180
RY-HI, ME, LO	RELAY ELECTRO MAGNETIC	C4104-170
RY-COMP	RELAY ELECTRO MAGNETIC	C4076-310
SSR1	SSR	C4092-060
SW1, SW2	PUSH SWITCH	C4001-200
FUSE	FUSE	XBA2C31TR0
X1	RESONATOR	F4090-010T
BZ	BUZZER (SOUND GENERATOR)	C4091-030
Q6~ Q8	TRANSISTOR	C4086-250T

Note

- All parts are supplied from TAMACO, Taiwan.

Electronic Controller: CWA741315 (CU-A281KR)

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SYMBOL	DESCRIPTION & NAME	PART NO.
IC1	INTEGRATED CIRCUIT	A52C78414Y
IC2	INTEGRATED CIRCUIT	A52C094
IC3	INTEGRATED CIRCUIT	A52C040
IC4	INTEGRATED CIRCUIT	A52MPA2003C
Q1	TRANSISTOR	A55C1740STPQ
Q2	TRANSISTOR	A55DTC113ZST
D1 ~ D6	DIODE	A54MA165TA5
DB1, DB2	DIODE BRIDGE	A54CS1VB20E
ZD1	ZENER DIODE	A54D7.5EL1TB
ZNR2 ~ ZNR4	ZNR	A54C353
T1, T2	TRANSFORMER	A40378
CR1	SURGE ABSORBER	A59014
CR2	SURGE ABSORBER	A59014
RY-HOT	RELAY	A00160
RY-DEICE	RELAY	A00160
RY-OFF	RELAY	A00160
RY-H/L	RELAY	A00160
RY-V	RELAY	A00160
FUSE	FUSE	XBA2C31TR0
X1	RESONATOR	A45ST4.0MGWT

Note

- All parts are supplied from MACC, Malaysia (Vendor Code: 086).

Electronic Controller: C3919-400 (CU-A281KR)

SYMBOL	DESCRIPTION & NAME	PART NO.
IC1, IC2	INTEGRATED CIRCUIT	J4083-070
Q1, Q2	TRANSISTOR	C4086-250T
D1 ~ D5, D7	DIODE	E4060-020T
RY-C, RY-L	RELAY ELECTRO MAGNETIC	C4104-090
Q3	TRANSISTOR	J4086-080T

Note

- All parts are supplied from TAMACO, Taiwan.

20. Electronic Circuit Diagram

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Fig. 1

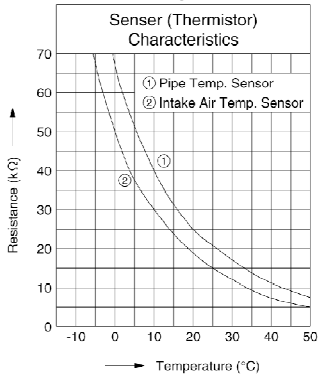

Fig. 2

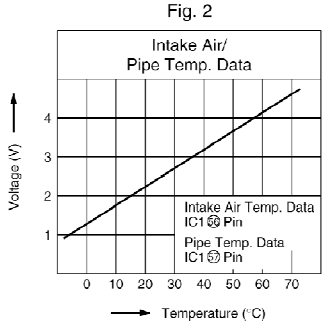

Fig. 3

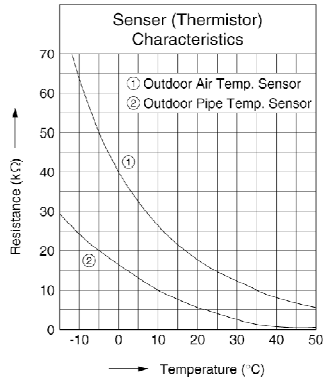

Fig. 4

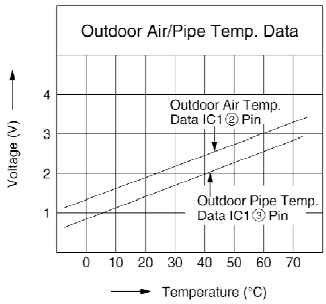

Fig. 5

OUTDOOR TEMP.	RISES		FALLS	
COOLING	OVER 29°C	Hi	OVER 31°C	Hi
SOFT DRY	BELOW 29°C	Lo	BELOW 31°C	Lo
HEATING	BELOW 15.5°C	Hi	BELOW 13.5°C	Hi
	OVER 15.5°C	Lo	OVER 13.5°C	Lo

How to use electronic circuit diagram

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Before using the circuit diagram, read the following carefully.

* Voltage measurement
  Voltage has been measured with a digital tester when the indoor fan is set at high fan speed under the following conditions without setting the timer.
  Use them for servicing.
  Voltage indication is in Red at all operations.

	Intake air temperature	Temperature setting	Discharge air temperature	Pipe temperature
Cooling	27°C	16°C	17°C	15°C
Heating	20°C	30°C	40°C	50°C

* Indications for resistance
  a. K....kΩ M....MΩ
  W...watt Not indicated....1/4W
  b. Type
  Not indicated.....carbon resister
  Tolerance±5%
  .....metal oxide resister
  Tolerance±1%

* Indications for capacitor
  a. Unit μ....μF P....pF
  b. Type Not indicated....ceramic capacitor
  (S).....S series aluminium electrolytic capacitor
  (Z).....Z series aluminium electrolytic capacitor
  (SU).....SU series aluminium electrolytic capacitor
  (P).....P series polyester system
  (SXE).....SXE series aluminium electrolytic capacitor
  (SRA).....SRA series aluminium electrolytic capacitor
  (KME).....KME series aluminium electrolytic capacitor

* Diode without indication.....MA165
※ Circuit Diagram is subject to change without notice for further development.

TIMER TABLE

Name		Time	Test mode (When test point Short-circuited)	Remarks
Sleep Mode Waiting		1 hr.	6 sec.	
Sleep Mode Operation		8 hrs.	48 sec.	
Real Timer		1 hr.	1 min.	
		10 min.	10 sec.	
		1 min.	1 sec.	
Time Delay Safety Control		2 min. 58 sec.	0 sec.	
Forced Operation		60 sec.	0 sec.	
Time Save Control		7 min.	42 sec.	
Anti-Freezing Control		4 min.	0 sec.	
Mode Judgement		20 sec.	0 sec.	
Soft Dry	Off	6 min.	36 sec.	
	On	10 min.	60 sec.	SOFT DRY: 10 min. operation
Deodorizing Control	Cooling	40 sec.	4 sec.	Comp. ON
		70 sec.	7 sec.	Comp. ON
		20 sec.	2 sec.	Comp. OFF
		180 sec.	18 sec.	Comp. OFF
	Soft Dry	40 sec.	4 sec.	Comp. ON
		360 sec.	36 sec.	Comp. OFF
Indoor Fan Step Change		1 sec.	0 sec.	
After Deice Ended		30 sec.	3 sec.	Comp. OFF, F/Motor ON
4-Way valve		5 min.	30 sec.	

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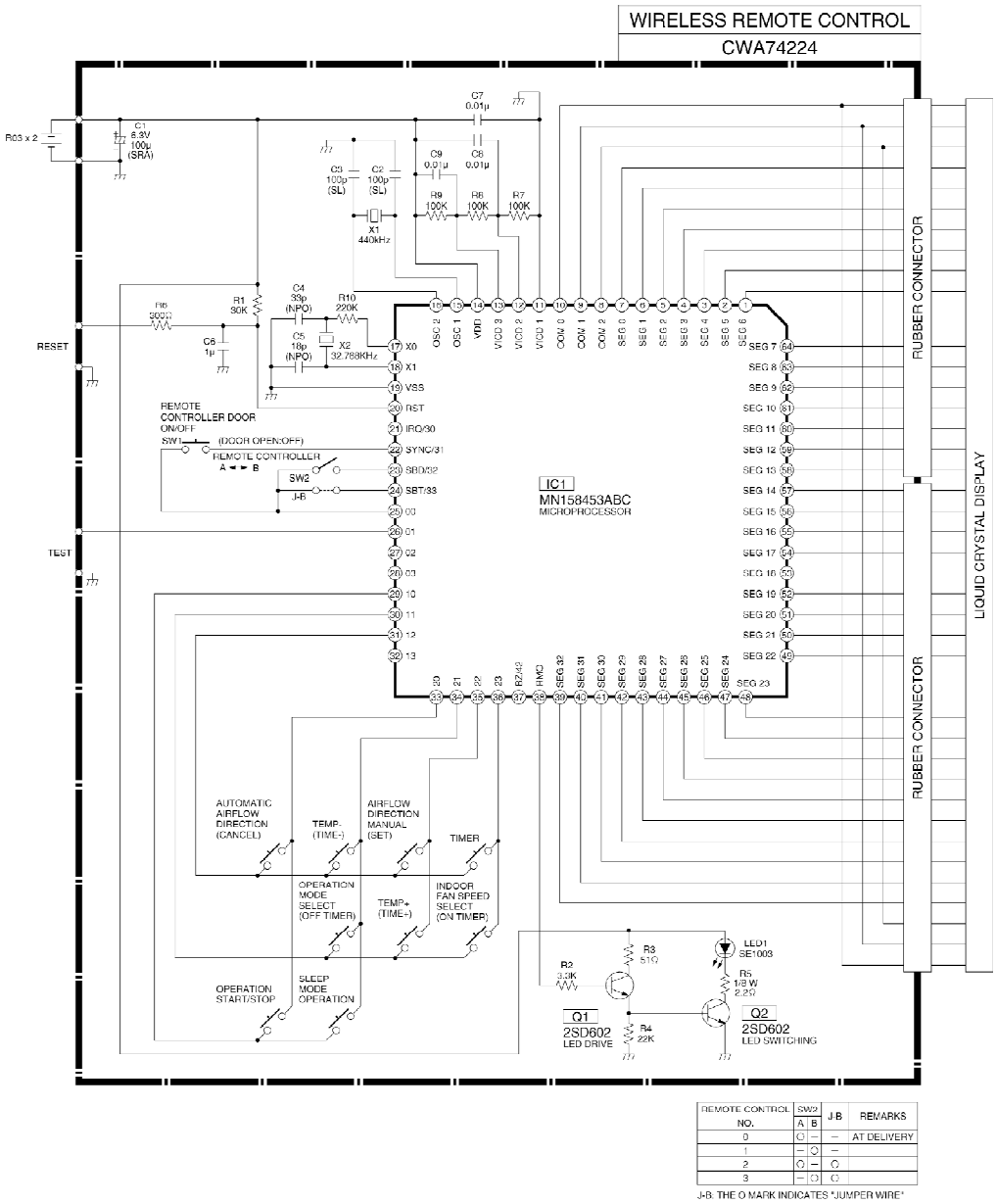
20.1. REMOTE CONTROL



REMOTE CONTROL NO.	SW2 A	SW2 B	J-B	REMARKS
0	○	–	–	AT DELIVERY
1	–	○	–	
2	○	–	○	
3	–	○	○	

J-B: THE ○ MARK INDICATES "JUMPER WIRE"

[MACC] Printed in Malaysia

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